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USSR Report

NATIONAL ECONOMY

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GOSAGROPROM RSFSR ROUND TABLE ASSESSES APK RESTRUCTURING

[Moscow SELSKOYE KHOZYAYSTVO ROSSII in Russian No 9, Sep 86 pp 10-13, 28

[Discussion: "Restructuring: Lessons and Prospects"]

[Text] At the editors' "Round Table", responsible workers in the RSFSR Gosagroprom summarized results from the first stage in restructuring the agro-industrial complex. The following participated in the discussion: G. V. Kulik, RSFSR Gosagroprom board member and chief, Main Administration for Planning and Social-economic Development; M. P. Kazakov, deputy chief, Main Administration for Planning and Social-economic Development, chief, Financial Administration; V. F. Yermakov, deputy chief, Administration for Planning Agricultural Production; E. A. Igron, chief, Automated Systems Administration; and Yu. N. Bychek, special correspondent for journal.

[Yu. Bychek] The well known CPSU Central Committee and USSR Council of Ministers decrees, passed last November and this March, specify a broad program of measures for fundamentally restructuring the APK's management system and economic mechanism. In the process of realizing this strategic program several practical questions arise among local managers and specialists. This was shown, in particular, by a conference held in Volgograd at the first of the year.

Take, for example, problems such as the optimization of APK structure, schemes for functional and line management at the level of the RSFSR, autonomous republics, krays, oblasts and rayons, and the legality of structural distinctions depending upon characteristics in territorial development, in particular, if there is a poorly developed system of processing enterprises. For example, there is the current question concerning the advisability of retaining oblast (kray) agricultural chemical assocations and, at the same time, breaking up similar associations in most other service and processing sectors.

There are a number of questions in connection with the transition to the resource-normative method of planning. Difficulties arise in integrating sectors into the APK and in elaborating measures to strengthen the economies

of money losing and low profit production operations under the conditions of the new economic mechanism. Now, when plan development for next year and the five-year plan as a whole is being completed, these and other questions acquire exceptionally great importance.

[G. Kulik] I will begin this discussion by recalling the basic importance of the APK restructuring now under way. As stressed in 27th Party Congress documents, we should see to the APK's accelerated development primarily through better use of existing production potential. The entire set of restructuring measures is subordinate to this.

We are fully justified in considering the first, organizational, stage as completed: APK structure and management has been unified at all levels, favorable conditions have been created for the more complete and thorough integration of sectors by making most enterprises directly subordinate to rayon agro-industrial associations.

However, unity does not mean complete unformity. A complicated and important matter such as the present restructuring should not be the place for stereotypes. In working out management schemes we tried to give maximum consideration to specifics in each oblast, kray and autonomous republic and to the suggestions of local, directive and operational organs.

Take the management of chemical use. At some places, because of their sufficiently strong base at kolkhozes and sovkhozes, the agrochemical services at the rayon level were liquidated, while those at the rayon level were transferred to direct subordination to RAPO. In other cases, where there was a developed network of interrayon chemical enterprises, oblast (kray) agricultural chemical services were retained. The same can be said regarding the management of food industry enterprises, where the approach was also varied. For example, in some oblasts the associations for the spirits, sugar, and starch-syrup industries were retained, while in others they were eliminated, and the enterprises placed directly under the agrocommittee departments. There are also some territorial differences in the management of other APK sectors.

Therefore, the readers' bewilderment is evidence that in some cases a sterotypical approach was not avoided, while in others far from all managers realized a simple and and immutable fact: the new management structure and the new economic mechanism give them considerably broader rights, but in exchange require a more responsible approach, that means more initiative and creativity.

The idea of expanding the legal and operational rights of kolkhozes, sovkhozes, other APK enterprises and new management organs runs like a red thread through party and government documents on restructuring. This is also a goal of the demand to switch to the normative method of planning in order to minimize voluntarism and other errors previously allowed in handing plan indicators down to oblasts, rayons and farms.

I want to especially stress the transition from planning the purchases of meat, milk, vegetables, potatoes and other agricultural products to planning

their deliveries to all-union and republic stocks. This radically changes the matter and enhances the responsibility of oblast, kray and republic (ASSR) operational and directive organs for supplying food to the public. Local organs obtain wide rights in maneuvering resources. While observing state supply discipline, they can exchange surplus products with other regions, hauling in things which are not locally produced or are produced in insufficient quantities. There are considerable expansions of farm's rights to sell products. This is exceptionally important for strengthening their economies.

It should be again stressed that the core of the new economic mechanism is the combination of broad rights and high responsibility. Thus, norms for the wages fund are now determined by farms themselves, while the fund depends upon output volume. Simultaneously, farms have increased responsibility for observing the socialist economy's main requirement -- increasing labor productivity faster than earnings. If not, the collective itself will suffer: allocations to the material incentive fund will decline. The same thing will happen if wages funds allocated to the farm are overspent.

[Yu. Bychek] Among the themes touched upon, one, the transition to the resource-normative planning method -- is of special importance. This is why. Today many recommendations and methodologies place emphasis upon the maximum, i.e. upon the widespread use of computers. However, not every rayon, to say nothing of every farm can use IVTs [Information-computer center] services in volumes sufficient for the suggested scientific methodology. Two questions arise. One is about alternative methodologies for sufficiently thoroughly and objectively processing input information without complicated computer hardware. The other is about the condition and development prospects for the information and computer base in the RSFSR Gosagroprom system.

[V. Yermakov] The following should be done, in accordance with the degree on improving the economic mechanism for operations and planning at kolkhozes and sovkhozes: based upon control figures for agricultural product purchases given to them, there should be limits on capital investments, the delivery of the main materials which are based upon normatives taking into account estimates of land values and the availability of productive capital, labor and other resources. All this is the basis for the methodology developed with our participation and approved by the USSR Gosagroprom. More accurately this is three independent methodologies, each of with can give a sufficiently reliable estimate of resource potentials for farms, rayons and oblasts.

The first is based upon estimating the area of comparable agricultural land. Using materials from the economic evaluation of land, data on the availability of fixed productive capital, circulating capital and labor resources, planning specialists compare agricultural land through a system of indexes. State purchases are expressed in terms of the actual production cost in the preplan period. The actual production cost for the last three years is determined by norms and compared with control figures calculated in the traditional manner. Deviations are corrected by normatives.

The second calculation method is based upon a monetary evaluation of productive resources. Cropland and perennial plantings are evaluated by the

payback rate, and natural forage lands -- hayfields and pastures -- by their productivity. One hundred points for cropland and perennial plantings is taken to be the countrywide average payback rate -- 2.65 rubles for every ruble in outlays. The evaluation of a hectare of cropland or planting is its points for payback rate, multiplied by a single countrywide monetary evaluation normative per point (18 rubles). After multiplying the monetary evaluation for each type of land by the area and totalling the results, we obtain a ruble denominated expression for a farm's land potential. Similar principles have been worked out for evaluating labor and material-technical resources. Their sums make up a farm's total resource potential. Purchase volumes are determined by average oblast production costs per 1,000 rubles of resource potential for oblast, rayon or farm, adjusted by a factor for this potential's use.

Both methods can be used without computers. This is in contrast to the third methodology, discussed in the journal's previous issue. It can only be effectively applied with the help of computers. It is based upon an evaluation of productive resources by degree of their influence upon commercial output. This method is interesting to those creating a "live" mathematical model of productive potentials for farms, rayons and oblast. It makes it possible to visually follow and analyze the interaction of all productive factors and, thanks to this, the selection of an optimal development strategy for an individual farm, rayon or oblast. If introduced on a sufficiently wide scale, this methodology could be used for large region, such as the entire Russian Federation.

In brief, this methodology is quicker and more effective because machine accounting accelerates the planning process many fold. Another detail is not superfluous: those who have tested it do not want to use any other method. However, it is still too early to recommend it for general use. The needed information-computer base is not available everywhere and it takes time to train personnel.

[E. Igron] I am entirely in agreement about the time factor. While a skilled economist needs a week of independent study to master the first two methods, this is not enough time for the third. Also, independent study is not advisable for the latter. It is necessary to have centralized training, for example through the system for improving qualifications. However, I cannot agree with assertion about the weakness of the information-computer base. To be frank, as organizers of the ASU, we ourselves are not completely satisfied with its condition, and that is putting it mildly. The facilities needed to handle the tasks mentioned are available in many oblasts.

[Yu. Bychek] One of the new economic mechanism's fundamental features is the expanded rights and economic independence of agricultural enterprises. However, from what has been said it follows that kolkhozes and sovkhozes are still given plans from above. Isn't there a contradiction here?

[V. Yermakov] In principle, no. This is because the normative-resource method is used from the top down, assuring the objectivity and balance of tasks for next and all subsequent years. The difference is only in the method for calculating normatives and the degree of detail in the latter. At the USSR Gosplan level only broad measures are taken into account: the country's

requirements for foodstuffs and agricultural raw materials and the total potential of APK's. At the farm level we are striving for maximum balance between resource supplies to kolkhozes and sovkhozes and the production targets given them. At the plan elaboration stage the agricultural enterprise manager has the right to dispute draft targets if an analysis using the normative-resource methodology shows their infeasibility. Such objections will be accepted.

[E. Igron] I want to stress one factor. To me, personally, it seems a serious shortcoming to have three equally valid methodologies, a situation which at this stage is, unfortunately, unavoidable. They are by no means equivalent and when applied to the same economic situation give results differing by 3-5 and more percent. For some managers it is a great temptation to use the one which shows the least potential and therefore assures the easiest target. Keep in mind: according to the new rules above-plan output remains at the farm's disposal and is sold at increased prices. From this it follows that methodologies should become unified. Soberly evaluating the situation, one can suggest that in the final account the third methodology will be approved as the most analytic and accurate, but this will be towards the five-year plan's end. Until then, during the period the new planning system arises, workers at RAPO planning-economic and financial services and territorial agro-industrial complexes should apply their maximum organizational and educational abilities. Their task is not only to show managers desiring to be "cunning" that their cunning is very shakey. The main thing is to convince them that they are striving for false advantages. They are now artifically understating their potential and therby gaining ten or so thousand rubles. Tomorrow these underutilized resources will turn into increased production costs and losses will amount to hundreds of thousands.

Continuing the discussion about normatives, I want to say that our IVTs are now working full speed on developing production normatives for farms, for example for direct outlays for plant and animal production. Special handbooks are being created for each oblast, where each farm can, as they say "find itself" and write what its material, fuel and other outlays should be for specific initial conditions. Such calculations have already been completed for 18 oblasts. In two years we plan to provide similar materials for all of Russia, the computer hardware available makes this possible. We have also set about developing a normative base for other sectors joining the APK. The final goal is the conversion of the entire agro-industrial complex to the normative-resource method of planning.

However, this is not all. The avalanche of primary operational information and reductions in the management staff have really presented the IVTs the problem of converting from massive information processing to evaluating the production, financial-economic and social situation at the farm, rayon and oblast.

[Yu. Bychek] In this there is the question: Given present data banks and software can this task realistically be handled?

[E. Igron] Yes, to a considerable extent. The information arriving at computer centers is sufficient to set up a complete, at least at first

approximation, unified data bank on the agro-industrial complex, from individual farms and enterprises to RSFSR Gosagroprom. There is also software on which to put this information, rapidly find and process it.

[M. Kazakov] All this is good. However, in my opinion even our primitive system for finding information is poorly developed. Take, for example, data on spare parts and other material resources.

Today every third rayon supply base has an automated information system, while central delivery bases for territorial agroproms are 100 percent supplied with information. The system stops at the rayon level, where the departmental interests of Goskomselkhoztekhnika previously ended. Our task is to as rapidly as possible close the information chain from resource distribution at republic Gosagroprom down to the use of each individual resource at specific agricultural or industrial enterprises. Then requests will become better substantiated, the operational nature of the supply process will improve and above norm supplies will simply not be formed. Incidentally, Volgograders' experience in supply organization affirms this.

Of course, we will develop the information network, but it is hard to expect very good results in this matter. Industry is simply in no condition to, in the next few years, completely meet the agroprom's needs for computer hardware, above all local networks of personal computers.

Therefore we have selected the direction in which available equipment can assure maximum returns in a short time. For example, about one third of kolkhozes and sovkhozes are actively using computer centers' services to solve production questions: programming yields, herd reproduction and breeding, calculating fertilizer needs, optimizing the machinery and tractor fleet and planning feed production. Computer assisted solutions to production tasks also gives large and quick returns in the form of increased field and farm productivity.

[Yu. Bychek] There should also be a discussion of questions in agroprom economic policy, changes in the system for capital investments and credit-financial relations.

[M. Kazakov] One of the most important and pivotal tasks under the new conditions is to assure the planning, financing and crediting of the entire agro-industrial complex as a single whole, overcoming the departmental fragmentation which existed prior to the Gosagroprom's formation. Quite a lot has been done in this direction during the first half year. This was particularly assisted by more than 97 percent of the enterprises being transferred directly to agroprom's in krays, oblasts and autonomous republics. True, the eliminated ministries and departments succeeded in giving their units targets for all types of activities. This complicated our work, because, in spite of their external similarity, in most cases the indicators handed down by the enterprises could not be aggregated. All plans had to be reworked, reducing them to a common denominator to assure financial and credit standardization. As a result, by the second quarter, budget allocations were covered without separation by type of activity, but for the agroprom as a whole. This, of course, created more favorable conditions for maneuvering

resources within the APK. By the third quarter short term bank credits had been put into similar order. Thus, territorial agro-industrial committees not only obtained formal rights, but also the practical possibility of distributing resources between sectors, farms and enterprises to improve the entire complex's activities.

The transfer of most resources to local organs is also a characteristic feature. Centralized funds only hold the minimum necessary to solve general republic tasks. This follows directly from the decree's requirement to improve the economic mechanism. On the one hand this mechanism provides for more strict centralization through planning and financing the entire complex as a single whole, while, on the other hand, it markedly expands local organs' economic independence and, correspondingly, more precisely delineates rights and obligations for management elements and levels.

For example, previously each ministry had the right allocate up to 15 percent of depreciation allowances for a major repair fund reserve. As a rule this accumulated in ministry funds. Was there any sense in this? Now only about 0.5 percent of depreciation allowances remains in the central reserves, while the remaining 14 percent is put at local organs' disposal so that they can solve local questions themselves. Unfortunately, everybody has not yet recognized the changed situation: local areas still bombard the center with requests to allocate money for these purposes. Recently the Novosibirsk Agroprom asked for 20,000 rubles for major repairs on a school building, although the committee reserve has more than 11 million rubles for other sectors. Of course, it is easier and safer to ask than it is to mobilize resources on one's own. However, the new economic mechanism is directed towards sharp and radical strengthening of local financial-economic work. This frees us, the republic Gosagroprom central apparatus, to solve more global questions, of general republic and even countrywide significance. Take the financing of measures to create and introduce new technology. We have still only made the first step, combining resources from ministries eliminated into a common fund for the agroprom. It is now necessary to take the next step -- working out standardized principles for this fund's formation in all sectors and preparing substantiated norms for allocations to it.

Or take an important theme such as further improvements in the agroprom economic mechanism. The party and government decree mentioned above entrusts us with preparing proposals by 1990. The economic experiments being conducted in a number of regions acqure exceptional importance in light of this. Thus, the Vologda Agroprom has been given planning rights and independence which are considerably broader than for others; while in Stavropol the entire agro-industrial complex has been converted to economic independence and self-financing. The Kuban Combine in Krasnodar Kray is an extremely interesting and promising form for an APK. In brief, the parts are being polished for an improved economic mechanism.

It is not yet the time to sum up the results from the experiment. I want to note that this is only because, as our local checks have shown, even the participants in the experiment are not fully exercising their new rights and possibilities. For example, managers of some experimental RAPO's still "hand down" capital investment plans to their subordinate farms and enterprises,

even though the experiment precisely states that such plans are formulated from below. We are trying to promptly catch such mistakes and correct them. However, the participants themselves should be more attentive. Kray and oblast agroproms should exercise more careful and constant control.

[Yu. Bychek] In connection with the coming conversion of agroproms, above all RAPOs, to economic independence and self-financing, the question of economic policies towards financial loss and low profit farms becomes especially acute. Under the new conditions they sharply limit the potentials for RAPO development. At the same time, to close them is quite often disadvantageous both socially and economically. Where is the way out?

[M. Kazakov] Actually, in spite of markups on purchase prices and extensions on paying back loans, the condition of such farms in a number of rayons in the Russian Federation remains difficult. The decree on further improvements in the economic mechanism makes provisions for a number of measures in this direction. These include the central allocation of 10 percent of total markups on purchase prices into union republic agroproms in order to give assistance to farms in especially difficult conditions.

Our committee has given local units instructions to compile, by September, a list of such farms and to determine for what kolkhozes and sovkhozes the markups can be reduced or removed altogether without harming their development. The latter is viewed as a source for a centralized fund. For the same purpose a number of agroproms, in particular Leningrad, Moscow, Gorky, and Lipetsk, where there is generally a quite high level of profitability, have been given targets to reduce markups by a total of 57 million rubles. Of course, this sum is not sufficient for a complete fund. Therefore, special attention should be given to local redistribution. Checkups show that practically everywhere there are farms which do not need markups. There are also those for which markups were clearly exaggerated. This, I note, does not stimulate collectives, but only dampens their ardour.

Also, during this five-year plan the targeted budget financing system has been retained for those farms which do not have resources sufficient for extended reproduction. However, in distributing these resources workers at local agroproms should not grant them in amounts above the established maximum markup simply for the appearance of material well-being. They should be paid back by real strengthening and production development. This is completely possible if there is serious organizational work and the extensive use of progressive forms such as successful farm managers' moral admonition and patronage over lagging farms, the introduction of scientifically based cropping systems, modern technology and the progressive organization of labor and production.

Of course, one cannot always expect that resources invested will bring large returns during the first year. If, even from the first months and days, the needed concern is not given to returns, the investment might not be recovered.

[G. Kulik] During the discussion it has become clear that many aspects of the new mechanism are not fully working. The question automatically arises: What is the reason for this? Why are many managers and specialists at farms, RAPO's

and even at territorial agrocommittees so poorly and unconfidentally using their new rights? Because they do not have a solid knowledge of them.

Recently, in accordance with directive organs' decisions, texts of party-government documents on agroprom restructuring and all the instructions were sent to local organs. It is important that this arsenal, its thoughts, spirit and letter be mastered by all enterprise managers and specialists. I want to especially stress specialists. It is not only kolkhoz and sovkhoz bookkeepers and economists who should perfectly know Party Central Committee and USSR Council of Minister Decrees and the instructions on their use andrealization issued by agroprom superior organs. These tools should be actively mastered by zootechnicians and agronomists, machinery operators and reclamation workers and all specialists at kolkhozes, sovkhozes and agro-industrial associations.

It is therefore important to once again organize local detailed study and work on all documents, instructions and statutes on improving the economic mechanism in all sectors of the agro-industrial complex. It is necessary to give tests to farm managers and specialists and to RAPO workers. I stress, tests on a deep knowledge of the material. Without this one cannot count on success, upon the effective use of the new economic mechanism or upon rapid growth in production.

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IMPROVEMENTS IN FERTILIZER ASSORTMENT URGED

Moscow KHIMIYA V SELSKOM KHOZYAYSTVE in Russian No 9, Sep 86 pp 2-4

[Article by A. S. Postnikov and S. A. Shafran, candidates of agricultural science, All-Russian Scientific Research and Planning Design Institute for the Chemicalization of Agriculture: "Improve the Assortment of Mineral Fertilizers"]

[Text] In order to create conditions for the extensive use of chemicals in crop production and to assure their high efficiency, a comprehensive program for using agricultural chemicals in the Russian Federation has been developed for 1986-1990. This program's implementation will permit the introduction of new progressive technology and scientifically based cropping systems, the more rational use of material resources and increases, in the form of additional output, in the payoff from chemical agents.

The chemical use program provides for significant increases in mineral fertilizer use: by 1990 it will increase by 25 percent over 1985. Each 1 hectare of cropland will receive 121 kg of nutrients, compared to 91 in 1985.

During the 12th Five-Year Plan great attention will be given to fertilizer applications on grain and feed crops. The program provides for higher increases in mineral fertilizer deliveries to grain growing regions. Fertilizers for grain crops grown by intensive technology are a priority. Taking into account the specifics of crop production in each zone, fertilizer applications have been determined. This especially concerns phosphorous fertilizers applied to rows during planting and nitrogen top dressings.

In recent years there have been considerable assortment changes in mineral fertilizers delivered to RSFSR agriculture. The assortment has broadened and nutrient concentration increased. The production of pelleted and large crystal fertilizers has increased. There have been substantial reductions in the share of ammonium nitrate in nitrogen fertilizer deliveries. While back in 1970 it made up 45 percent of such deliveries, in 1985 it only accounted for 28 percent. The percentage of ammonium sulfate has also declined, while more nitrogen is delivered in compound fertilizers and liquid ammonia.

There have also been great structural changes in phosphorous fertilizer deliveries. By 1985 the share of simple superphosphate had declined to 12 percent, compared to 65 percent in 1970, while there was a sharp increase in phosphorous deliveries in compound fertilizers (73 percent).

Potassium chloride accounts for 76 percent of potassium fertilizer deliveries. There have been substantial declines in the share of potassium salts and sylvinite.

Compound fertilizer production is expanding the fastest. At present it accounts for 36 percent of total deliveries, while in 1970 it was only 5 percent. Farms in the RSFSR mainly receive ammophos, nitroammophos and nitroamophoska [nitrogen-ammonia-phosphorous-potassium]. In recent years there have been increases in the production of azophoska [nitrogen-phosphorous-potassium] and liquid compound fertilizers.

In spite of industry's great achievements in mineral fertilizer production, the assortment of fertilizers delivered still does not completely satisfy agriculture's demand. There are not yet enough low concentrated forms, for example, ammonia liquor accounts for 13 percent of all nitrogen fertilizers.

Concerning assortment, one must dwell on the question of organizing the production and use of calcium-ammonium nitrate in the USSR. This fertilizer is widely used in Western Europe, as it has a number of advantages compared to the most widely used ammonia fertilizer -- ammonium nitrate. With the participation of VNIPIagrokhim [All-Union Scientific Research and Design Institute for Agricultural Chemicalization] and GIAP [State Scientific Research and Design Institute for the Nitrogen Industry and Organic Synthesis], in 1984 VNIPTIKhIM conducted production-operational tests on an experimental batch of calcium-ammonium nitrate, delivered by the Finnish firm Kemira, in the Volgograd, Kirov, Leningrad, Moscow, Novgorod and Pskov Selkhozkhimiya [Agricultural Chemical] Associations.

The fertilizer did not cake or deteriorate after 6-8 month storage in sacks or in bulk, while powdered mixtures, based on calcium-ammonium nitrate, retained their friability for months. calcium-ammonium nitrate is weaker than ammonium nitrate, acidifies the soil and thanks to its good physical properties, reduces losses during storage, transportation and application, it has the optimal combination of nutrients for plants, uniformity and high qualities for local applications and top dressing. Also, calcium-ammonium nitrate presents lower explosion and fire dangers than does ammonium nitrate. The Nonchernozem Zone' requires 1 million tons (active ingredients) of calcium-ammonium nitrate. However, the production question has still not been solved.

Farms are also not receiving slow acting nitrogen fertilizers especially necessary for irrigated land, which is increasing every year.

Potassium chloride is the main form of potassium fertilizer. It is about equal to other forms for most crops and soils. However, potassium sulfate is more effective on buckwheat, grapes, tobacco, flax and some other fruit and vegetables. The need for it is about 5 percent of total potassium fertilizers, however, at present agriculture is only getting 1 percent. Non-chloride

fertilizers are especially effective on sheltered ground, but again, there are not enough; potassium nitrate is especially scarce.

Despite the considerable increase in compound fertilizer production, their assortment does not meet agriculture's requirements. In accordance with the assortment worked out for up until 1990 by several scientific research institutions led by VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin], the Russian Federation requires 9 grades of compound fertilizers. The ammonia-phosphorous (1:4:0) and liquid compound fertilizers (1:3, 1:4) now produced for the overwhelming majority of crops and soils have unbalanced nutrient contents. A study of plans for fertilizer use on some farms in Moscow Oblast worked out using the RADOZ [not further identified] program, shows that not a single field requires applications of the following NPK ratios: 1:4:0, 1:3 or 4:0. Similar situations are observed in other oblasts in the Russian Federation and especially in the Nonchernozem Zone. In order to balance nutrient doses when applying ammonia or liquid compound fertilizers it is necessary to add nitrogen and potassium fertilizers (or nitrogen alone). This leads to additional costs.

Industry does not produce fertilizers in these ratios: 1.5:1:1; 1:1.5:1; 1:1:1.5; 1:1.5:1 or 1:1:0.5, the requirements for which amount to 43 percent of all compound fertilizer requirements. As a result, their use area is restricted, leading to overall reductions in mineral fertilizer efficiency, as labor and material outlays involved in transportation, storage and application preparations are considerably higher for single component fertilizers than for multicomponent ones.

There are difficulties in the use of a large list of mineral fertilizers. In 1985 farms in the RSFSR obtained 27 types of mineral fertilizers, which, in many cases, had eqivalent agronomic and economic effectiveness. Ammonium nitrate and urea are practically equivalent for most crops. Equal effects have been noted when top dressed on winter grain crops and when making main applications in all soil-climatic zones in the republic. However, urea has definite advantages for rice, for late top dressings to increase the protein content of winter and spring wheat and silage corn.

In the Nonchernozem Zone it has been found that ammonium nitrate is better than urea for top dressings on meadows. Consequently, in those soil-climatic zones where the effects of these fertilizers are equal, it is advisable to deliver only one of these forms. For example, in Moscow Oblast ammonium nitrate and urea are equally effective, except for top dressings on meadows and pastures. In Stavropol Kray urea should be preferred, as it has advantages on irrigated land and on late top dressings of winter wheat to increase protein content. Obviously, Moscow Oblast's requirements for nitrogen fertilizers can be met by ammonium nitrate, and, even better, by calcium-ammonium nitrate, while Stavropol Kray's by urea. However, both the oblast and the kray are delivered the two types. This creates difficulties in use, as it requires additional storage capacity, the repeated adjustment of machines for different application norms, etc.

Simple and double superphosphate are the most popular phosphate fertilizers. They are equally effective in various soil-climatic zones, on all crops, using

either broadcast or local applications. A question arises here concerning the advisability of delivering both forms of fertilizer to all oblasts, rayons and farms. For example, in 1985 Moscow Oblast received 4,000 tons of simple and 8,000 tons of double superphosphate, even though it would be possible to get along without one of these forms, sending the other to a neighboring oblast. Nitrophoska and nitroammophoska are 1:1:1 compound fertilizers. However, these are also delivered in specific proportions to oblasts, rayons and farms. In 1985 nitrophoska and nitroammophoska were delivered to Moscow Oblast. This same procedure also holds for some farms. Thus, in 1985 the Zvenigorodskiy Sovkhoz received ammonium nitrate, urea, ammonium sulfate and anhydrous ammonia; simple and double superphosphate; and potassium chloride, potassium salt, kalimagnesia and potassium sulfate; and, among compound fertilizers, ammonophos, nitroammonophos, nitrophoska and azophoska. Such a broad assortment at one farm considerably complicates tranportation, storage processing and application. It takes up storage space, and complicates machinery adjustments for applications and makes accounting more difficult.

Calculations made for this farm by VNIPTIKhIM show that in order to meet requirements for mineral fertilizers in the proper ratios it is only necessary to have 5 forms instead of the 16 delivered. If these 16 forms are replaced by ammonium sulfate, double superphosphate, potassium chloride, nitrophoska and azophoska, the economic effect for the sovkhoz would total 7,200 rubles, or 5.8 rubles per ton of nutrient. It isn't difficult to imagine the benefits which agriculture in the republic would obtain if mineral fertilizers were delivered in optimal assortments worked out for each farm.

Because the planning of mineral fertilizer deliveries is in term of nutrients, a situation is created where, for various reasons, suppliers and types are changed. As a result, in fulfilling the nutrient delivery plan there are also significant changes compared to the planned or to last year's figures. This makes it impossible to observe requirements in planning-estimation documentation and the technology for fertilizer application.

In order to eliminate these shortcomings it is advisable that each oblast, kray and autonomous republic be assigned permanent suppliers so that during a given period (five years) mineral fertilizer assortments do not change. As an experiment, this should be initially done in several oblasts.

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FERTILIZER DELIVERY STRUCTURE DESCRIBED

Moscow KHIMIYA V SELSKOM KHOZYAYSTVE in Russian No 9, Sep 86 pp 20-23

[Article by Ye. N. Yefremov, candidate of Chemistry, Central Institute for Agrochemical Services to Agriculture: "The Structure of Mineral Fertilizer Deliveries"]

[Text] In our country mineral fertilizer deliveries are increasing year after year. In 1985 agriculture received 25.4 million tons of nutrients with a nitrogen, phosphorous and potassium ratio equal to 1:0.65:0.6. Simultaneously, there was an expansion in mineral fertilizer assortment, which now includes more than 40 forms of single component and mixed fertilizers. However, in their speeches, delegates to the 27th CPSU Congress made serious criticisms of the mineral fertilizer industry and agrochemical services with regard to chemical agent assortment in some regions of the country. Thus, the existing structure of deliveries and the selection of mineral fertilizer types in North Kazakhstan do not meet the requirements of intensive technology for grain growing nor do they assure republic growers of a scientifically based nutrient ratio. Balanced nutrition is very important for the normal growth and development of spring wheat -- the main grain crop in Kazakhstan. Shortages and excessive amounts of nitrogen lead to disturbances in protein metabolism and quality. In the steppe and dry steppe zones the greatest effect is had by local applications of phosphorous fertilizers on fallow. However, a lot of ammophos (1:4:0) and very little simple and double superphosphate are delivered to regions in North Kazakhstan. The situation is made even more difficult by some of the simple superphosphate intended for Kazakhstan arriving the form of powder, which is difficult to use in regions where conservation tillage systems have been introduced.

The country's mineral fertilizer assortment is determined by many factors: the structure of agricultural production, patterns in fertilizer action in various soil-climatic zones, raw material and energy resources and their distribution, technology for mineral and byproduct fertilizer production.

Agriculture's requirements should be satisfied by effective and, at the same time, universal fertilizers, suitable for most crops, soils and application methods. The country's crop producers are experiencing an acute shortage of phosphorous fertilizers. Agriculture now obtains most (65 percent) of its phosphorus in the form of mixed fertilizers. The largest share of total

phosphorus containing fertilizers belongs to mixed fertilizers with unequal nitrogen/phosphorus ratios: ammophos (35 percent) and ZhKU [Liquid compound fertilizers]. Three component fertilizers with equal nutrient ratios -- nitrophoska, nitroammophoska and azophoska are delivered in smaller amounts (3.6 percent).

Table 1. Structure of Phosphorus Containing Fertilizer Deliveries in the 11th Five-Year Plan

Form of Fertilizer	Product's Share in Deliveries (percent) 1980	1985
Single component	48.4	36.4
Simple superphosphate*	20.3	10.9
Double superphosphate	12.2	14.3
Phosphate meal	14.8	10.2
Other	1.1	1.0
Mixed	51.6	63.6
Ammophos	36.3	34.0
Liquid compound fertilizer	0.6	11.1
Nitroammophos and nitrophos	8.0	8.0
Nitroammophoska and nitrophoska	6.4	3.5
Other	0.3	7.0

* Including granulated, powdered and ammoniated superphosphate

During the 11th Five-Year Plan the share of single component phosphorus fertilizers declined 1.4 fold (Table 1). The production of simple and double superphosphate meal has practically not increased at all. The small increase in double superphosphate deliveries to agriculture took place through imports. Ammophos still accounts for the main share of mixed fertilizers. During the five-year plan there were sharp increases in deliveries of 10:34:0 and 8:24:0 grade liquid compound fertilizers, but deliveries of nitroammofoska produced by sulfuric acid dissociation declined. The Central and Central-Chernozem regions in the RSFSR have started receiving sizable quantities of three component nitrophosphates (azophoska) obtained by the nitric acid dissociation of phosphate raw material. Technology makes it possible to obtain azophoska with 1:1:1 and 1:0.5:0.5 ratios. The first grade is desired by agricultural customers, but industry is oriented towards producing grades with increased nitrogen (21:11:11). The use of asophoska with such ratios is justified only on soils well supplied with nitrogen and potassium. The use of 21:11:11 azophoska on basic applications has a negative effect upon grain crop winter survival. At the end of the five-year plan agricultural enterprises in the Russian Federation started obtaining new forms of fertilizer: diammophos (1:2.5:0), diammophoska (1:3:2) and ammophosphate (1:7:0).

The regional distribution of mineral fertilizer deliveries is very uneven. Table 2 presents data on the delivery structure of mixed and single component fertilizers by union republic in 1985.

Table 2. Delivery Structure of Mineral Fertilizers by Union Republic, 1985 (in percent)

Republic	Nitrogen		Phosphorus*		Potassium	
	Single Component	Mixed	Single Component	Mixed	Single Component	Mixed
RSFSR	76.8	23.2	36.5	63.5	76.5	23.5
UkSSR	87.9	12.1	30.1	69.9	99.4	0.4
BSSR	86.5	13.5	24.3	75.7	96.0	4.0
Uzbek SSR	87.5	12.5	22.1	77.9	100.0	--
Kazakh SSR	55.0	45.0	16.2	83.8	100.0	--
Georgian SSR	77.5	22.5	74.1	25.9	99.9	0.1
Azerbaijan SSR	99.8	0.2	99.1	00.1	99.3	0.7
Lithuanian SSR	83.5	16.2	42.2	57.8	84.1	15.9
Moldavian SSR	85.0	15.0	40.2	59.8	99.8	0.2
Latvian SSR	81.4	18.6	30.2	69.8	94.9	5.1
Kirghiz SSR	80.1	19.9	20.6	79.4	100.0	--
Tajik SSR	80.6	19.4	20.1	79.4	100.0	--
Armenian SSR	99.8	0.2	99.8	0.2	98.9	1.1
Turkmen SSR	82.5	17.5	1.8	98.2	100.0	--
Estonian SSR	95.1	4.9	89.5	10.5	96.2	3.8

*Including phosphorite meal

Estonia and the Transcaucasian republics obtain very little mixed fertilizer. They obtain most of their phosphorous in the form of simple superphosphate. Mixed fertilizers do not account for more than 25 percent of total deliveries of phosphorus containing fertilizers to these republics. In the 6 other union republics (the RSFSR, the Ukraine, Belorussia, Lithuania, Moldavia and Latvia) mixed fertilizers' share is considerably higher: from 50 to 75 percent (for phosphorus). However, only in the RSFSR and Lithuania do three component fertilizers make up a substantial share of mixed fertilizers, in the remaining republics nitrogen-phosphorous fertilizers predominate. In the Ukraine, Belorussia, Latvia and the European part of the RSFSR, liquid compound fertilizer account for a notable share of phosphorous fertilizers. In Latvia liquid compound fertilizer make up 60 percent of total phosphorus deliveries.

Kazakhstan and the Central Asian republics obtain practically all (85-98 percent) of their phosphorus fertilizers in the form of mixed fertilizers. Ammophos (1:4:0) and nitroammophos (1:1:0) predominate in this region. As a consequence, Kazakhstan obtains more than 40 percent of its nitrogen in the form of mixed fertilizers. The Central Asian republics and Kazakhstan obtain no three component fertilizers at all. Such a fertilizer delivery structure leads to negative results. Economists [1] estimate that during the 11th Five-Year Plan the unfavorable assortment of fertilizers, in combination with other factors, led to a 74 percent overconsumption of fertilizers in Kazakhstan and to shortfalls in agricultural output, primarily grain.

During the 11th Five-Year Plan there have been improvements in the production and delivery structure of nitrogen (Table 3). There were increases in carbamide deliveries and sharp increases in the use of liquid ammonia, the

most concentrated ammonia fertilizer. In Belorussia, the Ukraine and Moldavia its share exceeded 10 percent of all nitrogen fertilizers. Ammonia liquor's share in the country-wide assortment remained at the previous level -- 9.3 percent. However, growers in the Ukraine, Belorussia and the Baltic republics obtain primarily ammonia liquor. It accounts for considerably more of the nitrogen fertilizers delivered to these regions -- 13-20 percent.

Table 3. Structure of Nitrogen Fertilizer Deliveries in 11th Five-Year Plan

	Product's Share in Deliveries (percent)	
Fertilizer	1980	1985
Single component	84.5	75.7
Ammonium nitrate	43.8	37.5
Carbamide	20.4	21.7
Liquid ammonia	2.6	7.3
Ammonia liquor	12.1	9.3
Mixed	15.9	24.3
Liquid compound fertilizers	0.2	2.4

Several years of tests on the efficiency of ammonia liquor were conducted at the Agrochemistry Department at Moscow State University. These showed that on acidic or poorly cultivated soddy-podzolic soils there were only insignificant increases in spring wheat yields during the first two years ammonia liquor was used and that after 5 years the systematic application of this fertilizer on the same fields even reduced yields compared to the control [2]. This is due to ammonia liquor's effect upon soil properties. Ammonia liquor deteriorates the agrochemical properties of acidic soddy-podzolic soils, intensifying exchange and hydrolytic activities and the soil's content of exchangeable aluminum and manganese. Ammonia liquor's negative effect is considerably reduced on limed and cultivated soils. This fertilizer should be applied to neutral or alkaline soils, but not in regions in the Baltic, Belorussia and the northern oblasts in the Ukraine.

There was a substantial increase in deliveries of mixed fertilizers during the 11th Five-Year Plan. However, they have both advantages and shortcomings. As a rule, mixed fertilizers contain more nutrients than do single component ones. This helps reduce labor and equipment costs for their use. However, the rigid fixing of nutrient ratios leads to overconsumption of some nutrients and hinders the precise observation of agrochemical service recommendations.

In order to harmonize the biological characteristics of crop nutrition and the technological potentials for mineral fertilizer production, proposals have been worked out to optimize mixed fertilizer deliveries in various regions. Many years of agrochemical research have shown that in our country it is necessary to produce 10-12 grades of mixed fertilizers with various nutrient ratios. The disputes are mainly over the structure of mixed fertilizer groups and their regional distribution.

It was previously thought that grade 1:1:1 should make up 37 percent of total mineral fertilizer deliveries. Another work [2] proposes the following

selection of 10 grades for the country's growers: (1:1:1; 1:1.5:1; 1:2.5:0; 1:0.7:1.2; 1:1:0; 1:4:0; 1:1:1.5; 1:2:0; 0:1:1 and 1:1.5:1.5).

Based on the RADOZ program, a method has been worked out for determining the mixed fertilizer requirements of farms and regions [3]. The method was tested on 15 farms in Moscow oblast which differed by agricultural speciality and soil fertility. Calculations showed that nutrient requirements for this group of farms could be 70 percent satisfied by 11 grades of mixed fertilizers: (1:0.7:1.1; 1:1:1; 1:0.5:0.5; 1:1:0.5; 1:0.7:0.7; 1:1.1:1.4; 1:0.5:1; 1:0.5:0.8; 1:0.4:0.7; 1:1.8:2; and 1:0.3:0.8). These ratios are different from the mixed fertilizer grades suggested by agrochemical services. Work [3] concludes that it is impossible to effectively and economically meet crop production's needs by producing mixed fertilizers with rigid nutrient ratios. However, the results permit different conclusions. First, the calculations do not support the advisability of using ammophos in Moscow Oblast. It accounts for more than 30 percent of phosphorus containing fertilizer deliveries. Secondly, the results indirectly support the conclusion that in the regional assortment the share of mixed fertilizers should not exceed 70 percent for phosphorus.

Forecasts predicted a sharp increase (6.5 fold) in nitroammophoska deliveries and surpluses in a number of regions [3]. However, this did not occur. Nitroammophoska production using sulfuric acid technology even declined, as industry was not able to prevent this fertilizer from caking. Now the RSFSR's Nonchernozem Zone does not have enough three component fertilizers with equal nutrient ratios even though experiments over many years have shown their high efficiency in row applications on grain crops, potatoes and other crops.

Specialists at USSR Gosagroprom scientific institutions have proposed a promising assortment of mineral fertilizers which take into account the requirements of intensive technology for crop production. The scientific bases for these proposals are the geographic patterns of fertilizer effects in various soil-climatic zones, biological characteristics of crop nutrition and soil fertility. Fertilizers with a 1:1:1 nutrient ratio play a leading role in this assortment. Nitrophoska, nitroammophoska and azophoska have this ratio. These fertilizers are used in various soil-climatic zones, especially the Nonchernozem Zone and the Lithuanian SSR. Grades in which phosphorous or phosphorus and potassium predominate over nitrogen (1:1.5:1 and 1:1.5:1.5) have quite a large share in this assortment. These fertilizers are effective on winter grain crops, potatoes and perennial grasses. Nitroammophoska (1:1.5:1.5) was previously produced at the Ammofos Production Association in Cherepovets and delivered to the Volga-Vyatka, Urals and West Siberian Economic Regions. However, this product is no longer produced at that association.

Phosphorus-potassium (0:1:1) fertilizers are effective in zones with sufficient moisture, especially on irrigated light textured soils. At present these grades are being produced in very limited amounts and are only used in the Lithuanian SSR. Ammonia phosphates (ammophos and diammophos) account for about 20 percent of the mixed fertilizer assortment. These fertilizers have good physical and mechanical properties and the phosphorus component is highly

soluble. The ammophos production technology makes it possible to process raw materials with low phosphorus content but with satisfactory techno-economic indicators.

Liquid compound fertilizers (10:34:0 and 11:37:0) should be further developed. Their deliveries should increase in the Volga and North Caucasus regions, the Ukraine, Moldavia and the Uzbek SSR.

In future assortments it is intended to use new single component phosphorus fertilizers -- superphos and potassium polyphosphate. On podzolized and leached out chernozems superphos is equal to soluble phosphates, and on soddy-podzolic and grey forest soils it is 90 percent as effective as double superphosphate. Consequently, it is advisable to deliver superphos to the Central-Chernozem and Central regions and to Belorussia. Potassium polyphosphate should be used on irrigated land in Kazakhstan and in the Central Asian republics. Under these conditions ammonia and amide forms have advantages over nitrate forms. Therefore carbamide and ammonium nitrate, and ammonium sulfate on rice growing areas should predominate in the nitrogen fertilizer assortment for Central Asia. Water solutions of carbamide and ammonium nitrate should be used as seasonal fertilizers in the North Caucasus regions of the RSFSR and in the Ukraine. The share of low concentrated fertilizers (ammonia liquor, kainite, ammonium-sodium sulfate and others) will decline. Over the long term the average concentration of nutrients in fertilizers should reach 45 percent.

Improvements in mineral fertilizer production and delivery structure outlined in the Comprehensive Program for the Chemicalization of the USSR National Economy will assure the more complete satisfaction of agriculture's needs for plant nutrients.

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USE OF MILK, BY-PRODUCTS FOR CATTLE FEED EXAMINED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 9, Sep 86 pp 107-110

[Article by V. Sergeyev, Tallin, candidate of economic sciences and head of a sector, Estonian branch VNIIKS: "Intensification in the Dairy Industry"]

[Text] A reduction in the feeding of milk to livestock -- an important reserve for increasing the food resources. A need for improving the milk accounting procedures. Efficient use of capital investments -- the foundation for accelerating the development of cheese-making.

In the political report by the General Secretary of the CPSU Central Committee M.S. Gorbachev to the 27th CPSU Congress, the following statement was made: "An immediate source for augmenting the food fund is that of reducing field and farm product losses during harvesting, transporting, storage and processing operations. Here we have a considerable reserve; the increase in resources for consumption can amount to 20 and for certain types of products -- up to 30 percent. Yes and the expenditures required for eliminating these losses are less by a factor of 2-3 than those required for the production of the same volume of products"*.

The above statement fully applies to the dairy branch of the APK [agroindustrial complex]. According to our computations, the best utilization of milk during 1985 could have produced 30 percent more nutritional dairy products than were actually obtained. Since 1958, our country has occupied first place throughout the world in milk production. In 1985, 98.2 million tons of milk (21.5 percent of the world's volume) were produced, despite the fact that our population constitutes only 5.8 percent of the world's population. Hence, our country's potential for satisfying the population's requirements for dairy products surpasses the average world level by a factor of 3.7. However, the production of the principal dairy products is considerably lower. According to our computations, in 1985, from each million tons of milk, only the production of animal oil corresponded to the average world level, while the production of cheese and dry dairy products was less by a factor of 2-3.

The principal reasons for this situation -- unjustifiably high milk consumption for feed purposes, considerable lag in the capabilities of the dairy industry

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* Materials of the 27th Congress of the Communist Party of the Soviet Union. Moscow: Politizdat, 1986, p 31.

compared to the production potential of agriculture, inefficient use of milk in the dairy industry, imperfections in accounting for the dairy resources and also departmental barriers which existed prior to the creation of USSR Gosagroprom. Thus, in 1964-1965 11.4 percent of the milk produced was fed to livestock, in 1976-1977 -- 13, in 1978-1979 -- 13.4, in 1980-1981 -- 14.1 and in 1983-1984 -- 13.5 percent. In addition, the livestock were fed a rich substitute (however, an increase in the deliveries of this substitute to agriculture did not lower the consumption of whole milk) and annually more than 20 million tons of fat-free milk and 8 million tons of whey, which in terms of their nutritional value were the equivalent of almost 13 million tons of whole milk. According to our computations, the population consumes approximately 86 percent of the milk butter produced, 65 percent of the protein and 55 percent of the lactose. These indicators are considerably higher in a majority of the developed countries. Hence, reserves are available for the additional production of dairy products through a reduction in the amounts of milk being fed to livestock.

The increased consumption of milk for feed purposes has resulted from the development of a variety of insufficiently justified norms for feeding whole and defatted milk (skim milk) to young agricultural animals and for the fattening of hogs and also from inadequate control over the observance of these norms.

An analysis of the recommended norms and the actual consumption of whole and defatted milk for the raising of calves and young pigs has shown that the norms differ substantially by republics and regions. Thus, in the Trans-Caucasus republics, it is recommended that 150 kilograms of milk and skimmed milk be expended for the raising of a replacement heifer and in the Lithuanian SSR -- 1.7 and 4 times more respectively. For the raising of a pedigree heifer in the central nonchernozem zone, the consumption norm for milk is 180-200 kilograms and skimmed milk -- 200-400 kilograms and in the central Asian republics the figures are greater by 1.7-2.0 and 2.3-2.5 times respectively. The range of fluctuations in the consumption norms for milk and skimmed milk in the raising of pedigree young bulls and calves for meat purposes is also considerable.

We computed the average norms for the consumption of milk and skimmed milk for the raising of calves taking into account the structure of a restored herd in the union republics. But they are being observed only in the Georgian SSR, Azerbaijan SSR, Armenian SSR, Kazakh SSR and Tajik SSR. In all of the remaining republics, there is considerable over-consumption of milk protein.

In conformity with the feed norms introduced into operations in the late 1960's, the livestock must be supplied mainly with milk protein, since the industrial production of starter mixed feeds and whole milk substitutes has only just commenced. These substitutes are presently being supplied to agriculture in volumes computed in millions of tons. Meanwhile, the expenditures of milk for feeding to livestock are not declining. Young stock are being fed whole milk substitutes, starter feeds, skimmed milk and also whole milk in considerably larger volumes than they actually require and this is resulting in the norms being exceeded particularly in the Baltic and some other republics. Thus, in the Lithuanian SSR, 1.5-1.7 times more milk and skimmed milk is being expended for the raising of a calf than the amount called for in the norms, while simultaneously there is an over-expenditure of starter mixed feed in the

Estonian SSR (during the past five-year plan) -- from 62 to 85 kilograms of starter mixed feeds. Roughly 42 kilograms of starter mixed feed, 135 kilograms of whole milk and 450 kilograms of skimmed milk are sufficient for raising a dairy heifer or young bull for meat purposes. But they are actually being fed from 380 to 443 kilograms of whole milk or its substitute and from 539 to 635 kilograms of skimmed milk, buttermilk and whey. Thus, with an over-expenditure of starter mixed feed the consumption of whole milk and its substitute exceeded the recommended norms by a factor of 2.8-3.3 and skimmed milk -- by 10-40 percent.

In the Moldavian SSR, the consumption of whole milk is greater than the norm by a factor of 2-2.2 and skimmed milk -- by a factor of 1.4-1.7, with a simultaneous over-expenditure of starter mixed feed. A similar situation is being observed in the Latvian SSR and the Uzbek SSR. The over-consumption of milk and skimmed milk for the raising of calves is somewhat lower in the RSFSR, Belorussian SSR and the Ukrainian SSR and yet it is still substantial.

At the same time, the possibility of raising calves with a rational consumption of milk (60-80 kilograms), its substitute and skimmed milk (250 kilograms) has been proven. For the raising of an elite-record class heifer, for example, use can be made of the following consumption norms: whole milk -- 88.5 kilograms, dry skimmed milk -- 37 kilograms and whole milk substitute with an overall nutritional value equivalent to 190 kilograms of whole milk and 215 kilograms of skimmed milk. Cows are being raised in some countries on reduced expenditures of milk protein and annual yields of 5,000-6,000 kilograms of milk are being obtained.

However, leading domestic and foreign experience is slowly being introduced into livestock husbandry operations. Moreover, during the past five-year plan an increase was observed in the consumption of whole milk and its substitute for the raising of calves (in 1984 -- 336 kilograms or 6 percent more than in 1980). It increased sharply in the Kirghiz SSR (by 20 percent), Moldavian SSR (by 19 percent) and in the Belorussian SSR (by 15 percent), amounting respectively to 534, 525 and 459 kilograms. Their consumption increased by 13 percent in the Ukrainian SSR, reaching 370 kilograms and by 8 percent in the Latvian SSR and Lithuanian SSR (317 and 385 kilograms). In addition to whole milk and its substitute, the calves were also fed defatted milk, buttermilk and whey in excess of the norms.

Owing to great differences in the regional norms for milk consumption and the absence of control over the observance of these norms, considerable over-expenditures of milk are being tolerated in the raising of young pigs. In the Armenian SSR, for example, the recommendations call for the consumption in mountainous regions of 3.5 kilograms of milk alone, in the Ukrainian SSR -- 16-17.5 kilograms of skimmed milk and in the Lithuanian SSR -- 15 kilograms of milk and 18-20 kilograms of skimmed milk. The recommended norms for the consumption of skimmed milk for the raising of replacement young hogs in the central nonchernozem zone varies from 48 to 240 kilograms for one head. Meanwhile, studies carried out at the Estonian Agricultural Academy have proven the possibility of raising young pigs on mixed feed, with no use being made of milk or skimmed milk and replacement young stock -- with no skimmed milk being used.

In the absence of starter mixed feed in the Estonian SSR, an over-expenditure of 10 kilograms of whole milk is being tolerated in the raising of a young pig. Whole milk is not required when 30 kilograms of starter mixed feed are fed to the animals. During the past five-year plan, at kolkhozes and sovkhozes throughout the republic, from 36 to 40 kilograms of starter mixed feed and from 14 to 23 kilograms of whole milk and its substitute and also 1.3 to 1.6 quintals of skimmed milk, buttermilk and whey were expended for a young pig. The amount of milk used for this purpose in the Lithuanian SSR exceeded the norm by a factor of 1.6-1.7, with a simultaneous consumption of starter mixed feed that exceeded by a factor of 1.5-1.9 the volume which precludes the need for using milk or skimmed milk. Nevertheless, 1.5-1.6 quintals of skimmed milk were expended for a young pig.

Analysis has shown that the consumption norms for milk protein for the raising of young pigs are being observed only in the Trans-Caucasus republics. They have been exceeded to a considerable degree in the remaining republics. In the Uzbek SSR, for example, up to 2.3 quintals are being expended for each hog raised and in the Turkmen SSR -- more than 5 quintals of skimmed milk.

As is known, whole milk substitute is being produced for the purpose of lowering the consumption of whole milk for feed purposes. It appears as milk in which the milk butter has been replaced by other types of nutritious fats and to which antibiotics and vitamins have been added. The industrial production of this product commenced in our country in 1971 and in 1985 it was produced in an amount which made it possible to release more than 3 million tons of milk for feed purposes. However, the population did not receive this volume of milk. Why?

In 1965, when we still did not have whole milk substitute, 10.8 percent of the milk produced was fed to the livestock. In 1980, deliveries of the substitute to agriculture made it possible to reduce milk consumption by 2 million tons and accordingly achieve a reduction in the proportion of milk being fed to the livestock compared to the 1965 level. But this did not happen. The expenditure of whole milk amounted to 13.8 percent and, in a ddition, use was made of whole milk substitute, which could release for food purposes 2.2 percent of the milk produced. In all, 16 percent of the milk produced, that is, more by a factor of 1.5 than the amount for 1965, was fed to the livestock. A similar picture was observed during the 1981-1984 period. As the deliveries of the milk substitute to agriculture increased, the consumption of whole milk for feed purposes also increased.

In our opinion, this came about owing to the following factor. Some farms, while using the milk substitute, simultaneously wrote off milk which actually was not produced but which was supposedly fed to the livestock within the permissible norms.

In 1983, the people's control commitee carried out a check on the correctness of milk consumption for feed purposes in certain regions of the Estonian SSR. An over-expenditure of milk was established at all six of the farms checked in Tartuskiy Rayon and at the same time it was noted that 6 tons of milk that had not been produced were written off at the Babadus Kolkhoz in Raplaskiy Rayon for the raising of young stock. Following a discussion of the results of the check, the consumption of milk for feeding to livestock declined by 20 percent compared to the corresponding period for 1982. During subsequent years, there

was a relaxation of control and in 1985 Tartuskiy Rayon once again exceeded the average republic level for milk consumption for feed purposes.

However, periodic controls are not sufficient. A requirement also exists for economic levers which will make above-normal feeding of milk protein to livestock unprofitable. Towards this end, scientifically sound norms should ideally be developed and placed in operation for the expenditure of milk protein for the production, for example, of 100 tons of live weight of hogs, sheep, cattle or other livestock. These norms must be developed taking into account the overall expenditure of milk protein in whole milk, skimmed milk and substitute and also the volume of starter mixed feed, with the aid of which young stock can be raised with a reduced amount of milk protein. In some regions, milk protein is being added to the starter feed. For example, more than 6,500 tons of dry defatted milk is being expended for the production of such feed in the Estonian SSR.

The recommended norms must take into account the requirement for milk protein for the raising and fattening of livestock to the normal delivery condition, in keeping with the efficient management of livestock husbandry operations. Farms which supply the state with young stock or sub-standard livestock will expend too much milk protein per unit of live weight relative to the norm. In such cases, the extent of plan fulfillment in the production of milk by a farm must be reduced by an amount corresponding to the over-expenditure in milk protein.

The proposed norms orient the farm leaders towards the efficient management of livestock husbandry operations, terminating the deliveries to the state of unfattened young stock and reducing the consumption of deficit and costly feed during the milking period in the reproduction of cattle. They should be differentiated by regions of the country and within regions -- taking into account the trend in livestock husbandry. Farms which are engaged in pedigree livestock husbandry operations must have a higher norm than farms which are raising livestock for meat purposes.

Ideally, the accounting for the country's milk resources should also be regulated. At the present time, it is being carried out based upon the milk butter balances. Under this system of accounting, tens of millions of tons of defatted milk, buttermilk and whey are lost from the milk resources as having no milk butter, when in fact they do contain milk butter. According to the milk balances composed by the USSR Central Statistical Administration, these products are considered to have been consumed by the population, when in actuality they were fed to the livestock. Thus a twofold type of accounting for the milk resources is needed: according to the milk butter balances and according to the dry defatted milk residue balances. Such a system is being followed in the U.S.A. and England.

Prior to introducing the system of twofold balances, the accounting for milk substitute resources and for the milk made available as a result of the use of such resources must be regulated. We are presently lacking a statute which regulates the relationships between the supplier of the milk substitute and its consumer. It is believed that use of the substitute on the farms is making milk available for sale to the state or to the population at the site. In reality, the farms are to a certain degree fulfilling their plans for the

production and sale of milk to the state by means of the milk substitute funds and in the process they are realizing a considerable income as a result of the difference in prices.

We are of the opinion that a need exists for a statute which would view the supplying of milk substitute by the state as a temporary loan to the farms subject to repayment. Moreover, the milk obtained through the use of such a loan would be excluded from the volumes associated with fulfillment of the plans for selling milk to the state. In other words, the statute employed for forage and seed loans should ideally be extended to cover this product.

A requirement also exists for regulating the accounting procedures for milk substitute. When composing the annual reports of kolkhozes and sovkhozes in accordance with the instructions, the various types of industrially produced whole milk substitute must be converted into a dry substitute with a feed value of 2.3 feed units per kilogram. In the annual reports, use is made of coefficients ranging from 1.6 to 2.2 feed units per kilogram, coefficients which distort the actual consumption of feed per quintal of weight increase in the livestock.

In order to reduce the above-norm feeding of milk protein to livestock, the prices for the skimmed milk turned over to the farms should be regulated. This product is delivered to the farms at the rate of 10 rubles per ton (it is sold to the food industry for 30 rubles and it costs the state almost 160 rubles, if we evaluate it proportional to its nutritional value and based upon the actual purchase prices for whole milk of basic fat content). Such a price was established in 1961 when the purchase prices for milk were lower than the actual prices by a factor of 2.3. Since that time, the production cost for feed in agriculture has increased substantially. As a result, skimmed milk has turned out to be the cheapest feed. The cost for 1 feed unit in skimmed milk is equal to the production cost for a feed unit in pasture feed and green top dressing. The actual production cost for 1 feed unit in skimmed milk (if we evaluate it according to the production cost for milk production, while taking into account the ratios for their feed values) exceeds the actual price by a factor of 6-7. Thus the farms are economically interested in obtaining the maximum possible quantities of skimmed milk for feeding it to the livestock. It is our opinion that the increase in the prices for skimmed milk delivered to the farms must be carried out by stages, with the need for developing the processing capabilities of industry being taken into account. Initially, it should be raised to the price level at which defatted milk is sold to state enterprises and subsequently the price should be raised to the level which eliminates the state subsidy to the dairy industry for raw materials. The prices for whey sold to kolkhozes and sovkhozes for 3 rubles per ton should be carefully weighed.

The raised consumption of milk protein for feed purposes, especially during the second and third quarters, derives from the fact that it is during this period that a large portion of the milk being received is processed into butter and thus insufficient capabilities are available for the complete processing of the defatted milk and buttermilk that is obtained. In the interest of preventing spoilage, these valuable food products are returned to agriculture and fed to the livestock over and above the nominal requirements. However, full use is not

being made of the available capabilities in all areas. In the Kazakh SSR, for example, 135,000-137,000 tons of skimmed milk over and above the norm are being returned to the farms annually and at the same time the capabilities for producing dry defatted milk, whole milk substitute and dry whey are being utilized to only 80 percent, or lower than the average for the country by 10 points.

The above-norm feeding of defatted milk and buttermilk to livestock can be terminated only through a considerable expansion and improved utilization of the existing capabilities for cheese making and the drying of dairy products. During the 12th Five-Year Plan, the plans call for the placing in operation of 1.8 times more milk-drying capabilities than were available during the previous five-year plan.

A reduction in the rates of development for cheese-making capabilities during the 1971-1985 period resulted in cheese production lagging behind the average world level. In order to change this situation, it is our opinion that the production volumes and the distribution of the cheese making enterprises should ideally be re-examined. Keeping in mind the raw material resources, the plans call for the greatest number of these enterprises to be placed in operation in the Armenian SSR and the Georgian SSR, where by the end of the 11th Five-Year Plan the production volume for cheeses exceeded the average world level by 2.2 and 1.8 times respectively and the workload of the existing capabilities was less in the Armenian SSR by 13 percent and in the Georgian SSR -- by twofold, compared to the average for the country (owing to a shortage of milk).

In the Trans-Caucasus republics, a high proportion of the milk is being processed into cheese (in the Armenian SSR, for example, 65 percent of the milk procured) and there is a shortage of whole milk products. The per capita consumption of whole milk products in the Armenian SSR is lower than the average union level by a factor of 2, in the Georgian SSR -- by 2.6 and in the Azerbaijan SSR -- by a factor of 3.2.

It is obvious that during the 12th Five-Year Plan a great amount of attention must be given in these republics to developing the production of whole milk products. Additional opportunities must be found for developing cheese-making in the Kazakh SSR and in some regions of the RSFSR, where there are raw material resources and yet the number of new capabilities planned for introduction into operations during the 12th Five-Year Plan is lower than the average level for the country.

The principal means for raising the intensity of the dairy branch of the country's APK /agroindustrial complex/ during the 12th and subsequent five-year plans -- reducing the consumption of milk for feed purposes, developing the milk-drying and cheese-making branches of industry and increasing the deliveries of whole milk products to the population.

7026
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LIVESTOCK, FEED SECTOR SCIENTIFIC, TECHNICAL INTENSIFICATION

Moscow TEKHNIKA V SELSKOM KHOZYAYSTVE in Russian No 8, Aug 86 pp 3-5

/Article by V.I. Dubovik, deputy chief of the Mechanization and Electrification Department of USSR Gosagroprom: "Acceleration in Scientific-Technical Progress in Livestock Husbandry"/

/Text/ The country's livestock breeders were assigned large tasks during the 27th CPSU Congress -- by 1990, to raise the production of meat in dressed weight to 21 million tons, milk to 106-110 million tons and eggs to 80-82 billion units and to achieve noticeable improvements during the curent five-year plan in supplying the residents of cities and villages with animal husbandry products. In order to achieve this goal, it will be necessary to more than double the rates of growth for their production and this is possible based upon a strengthening of the logistical base, the introduction of new equipment and a decisive conversion of livestock husbandry and feed production over to the intensive methods of development.

In recent years the party and government have been allocating considerable resources for the production of machines and equipment for this branch. Today industry is supplying more than 650 types of technical equipment for livestock husbandry and feed production, including 230 new items developed during the 11th Five-Year Plan. Sixteen million electric motors, approximately 3 million electrical units and more than 600,000 fire-tube boilers are in operation in agriculture. During the years of the 11th Five-Year Plan, the power-worker ratio increased by a factor of 1.34 and reached 4,919 kilowatt hours. The volume of work carried out throughout the branch in connection with the installation of equipment amounted to more than 6.7 billion rubles.

As a result, the level of all-round mechanization increased and in 1985 it reached 58 percent for cattle farms and complexes, in swine husbandry -- 72 and in poultry production -- 84 percent. Labor expenditures for the production of goods declined.

However, the level of mechanization is still not in keeping with the modern branch requirements. The percentage for manual operations in dairy cattle husbandry is still 40-45 percent, in swine husbandry -- 60, in poultry production -- 50 and in sheep raising -- 80 percent.

During the current five-year plan, the rural areas will be supplied with 17 billion rubles worth of equipment for farms and complexes, 7.3 billion rubles

worth of work in connection with the installation and adjustment of livestock husbandry equipment will be carried out and facilities for the maintenance of 15 million cattle, 7 million hogs and 66 million poultry will be completely mechanized. In addition, 14,000 feed preparation shops will be placed in operation. The level of all-round mechanization on cattle farms and complexes will reach 70 percent, in swine husbandry -- 75 and in poultry production -- 92 percent.

An acceleration is taking place in scientific-technical progress in livestock husbandry and feed production in conformity with a scientifically sound machine system for 1986-1995.

During the current five-year plan, the new system of machines calls for the introduction into operations of 962 types of technical equipment, of which number 440 will be new types, including 380 for the mechanization of manual operations and new technological processes. A considerable number of them will be supplied in the form of sets of equipment and technological lines with automatic equipment. An expansion will take place in the use of electric power in technological processes and there will be a considerable increase in the power-worker ratio. In 1990, the overall consumption of electric power in agriculture will amount to 210-235 billion kilowatt hours.

The successes achieved by collectives on leading farms are the result of well organized feed production and feed preparation operations. Thus progressive technologies for the procurement and preparation of feed must be introduced into operations on a more extensive scale. Deserving of attention is a technology for the preparation of feed from grain and corn ears of a raised moisture content, which makes it possible to reduce fuel consumption by 15-30 kilograms per ton of bulk and to lower labor expenditures during fuel storage and delivery operations by a factor of two. For the purpose of implementing this technology, industry has mastered the production of the LIK-F-20 line. The plans call for the production of more than 2,200 of these lines prior to the end of the five-year plan. In the RSFSR and the Ukrainian SSR, M-8 and IRM-50 feed mincers are being produced for this purpose. The procurement of such feed in the amount of 62.3 million tons will make it possible to realize a savings of 1.4 million tons of liquid fuel during the five-year plan.

The highly effective technology for procuring haylage in BS-9.15 towers made out of concrete units must undergo further development. Studies carried out by scientific-research institutes and machine testing stations and also experience accumulated over a period of many years in many regions and on many farms reveal that haylage losses in BS-9.15 towers are two times less than those which take place in trenches and the nutritional value of such haylage is higher by 15-20 percent. The economic effect realized from the procurement and storage of haylage in a tower, compared to the use of trenches, amounts up to 7,000 rubles. During the current five-year plan, new and highly productive machines for the loading, distribution and unloading of haylage will be produced for this technology.

The production of mixed feed must undergo considerable development. More than 24 million tons of mixed feed must be produced annually at inter-farm, kolkhoz and sovkhoz mixed feed enterprises alone. Towards this end, use must be made of highly productive mixed feed shops equipped with OTsK-4-1 units and also

small scale mixed feed units. Automatic OTsK-4-1 mixed feed equipment with weight dosing will be supplied in module form and in the form of unit-containers and this will reduce by a factor of two the labor expenditures required for its installation and adjustment. The preparation of complete-ration internally produced mixed feed, using OTsK-4 and OTsK-4-1 automatic units and small scale mixed feed units, will make it possible to economize in the use of grain and reduce feed consumption per quintal of weight increase in hogs by a factor of 1.5.

Feed preparation shops which ensure the processing and preparation of feed for cattle farms and sheep raising, using local feed resources and based upon the experience of farms in Belgorod Oblast, must be introduced into operations on a more extensive scale. The preparation of complete-ration feed mixtures at such feed preparation shops, in the absence of thermal processing, will make it possible to save a considerable amount of fuel.

Lines and equipment for obtaining grass meal, for the thermal processing of straw and others will undergo further development and improvement.

In dairy cattle husbandry, the introduction into operations of progressive technologies for the maintenance of animals and new equipment for achieving reductions in labor expenditures must be accelerated. The use of stanchion maintenance for cows, with use being made of automatic stanchions and milking in parlors using automatic Tandem-Avtomat UDA-8A units, is making it possible to raise the workload per farm worker to 25-30 cows.

High results have been achieved on a dairy farm of the imeni Frunze gosplemzavod /state breeding plant/ in the Crimea Oblast, where by means of the flow-line-conveyer technology for cow maintenance and using the automatic Yelochka-Avtomat UDA-16A milking units, labor expenditures per quintal of milk were reduced to 3.4 hours and the workload per machine milking operator was raised to 150 cows. Such technologies and equipment, in addition to simpler solutions, can be employed for both new construction and for the modernization of dairy farms, with the natural climatic conditions of the regions being taken into consideration. This technology should be employed for the modernization of small (up to 100 cows) dairy farms, of which there are more than 20,000.

The introduction of ASUTP's /automatic systems for controlling technological processes/ into operations must undergo further development in dairy livestock husbandry. The production of milking units of the Yelochka and Tandem types, with second generation MD-F-1 manipulators, is already being mastered and the production of manipulators for UOV-F-1 udder processing units is being organized. An ASUTP is being used successfully on dairy farms of the VNIIMOZh Institute, at the Kirghiz Machine Testing Station with its cow productivity of 4,000-4,500 kilograms annually and at a number of other dairy complexes throughout the country. The automation of dairy farms ensures a reduction in labor expenditures of 30-50 percent and an increase in cattle productivity of 5.5 percent. The annual economic effect realized from the use of an ASUTP at a dairy complex for 800 cows is approximately 50,000 rubles.

Use of the new machine system in swine husbandry will ensure the introduction of a rhythmic production line operation for pork. The machines and equipment

for swine husbandry complexes and mechanized farms having a completed production cycle of from 6,000 to 36,000 hogs annually must undergo more extensive development. Automatic shops for the raising and fattening of hogs on complete ration mixed feeds and internally produced feeds and effective equipment for hog farms for up to 1,000 head, non-specialized kolkhozes, sovkhozes and subsidiary farms of enterprises and organizations must be created. Use must be made of KPO-150, KPO-75, KPO-35 and other sets of equipment for the fattening of hogs on food waste scraps.

In sheep raising, the system of machines will ensure the implementation of mechanized technologies for the pasture-stable maintenance of brood stock, with use being made of the enclosure-pasturing system for sheep on pastures, with milking of the sheep at special installations, with artificial raising of 10-20 percent of the lambs and with fattening of the young stock at specialized sites. By the end of the five-year plan, the proportion of sheep raising carried out on an industrial basis will amount to not less than 15 percent.

In poultry raising, equipment for the automation of technological processes using micro-processor and electronic-optical equipment will be introduced into operations in an especially active manner: manipulators for loading the lines for the processing and packing of eggs, mechanized and automatic sets of manipulators for egg storehouses involving the use of robot-technical equipment and electronic-optical units for the counting, quality-checking and sorting of eggs. The use of robot-technical units in poultry raising will make it possible to create, based upon the use of flow-line processes, closed ASUTP's for the production of eggs and poultry meat. The first such automatic system is already being created at the Saratov Poultry Factory.

A large national task is that of achieving economies in the use of fuel and energy resources and developing resource-conservation into a decisive source for satisfying the increasing requirements for fuel. Thus importance is being attached at the present time to disseminating on a more extensive scale the experience accumulated in the use of non-traditional sources of energy (sun, wind, biogas, heat recovery units and others), using fire-tube boilers instead of electric boilers, electric water heaters and electrical heating elements and introducing into operations more energy conserving technologies and more efficient heating equipment.

The implementation of the new system of machines will make it possible to increase considerably the number of animals and poultry assigned to a farm or complex worker, it will reduce operational expenses for obtaining products by 20-25 percent and it will lower direct labor expenditures by a factor of 1.5-1.9. The requirements for service personnel on the farms and complexes will be reduced by 1.5-1.6 million workers.

An acceleration in scientific-technical progress in livestock husbandry is possible based upon further improvements in the specialized service responsible for carrying out installation and start-up and adjustment work. Its further development calls for the complete carrying out of a cycle of work concerned with the mechanization of farms and complexes, commencing with the planning stage and the installation and adjustment of equipment and ending with the start-up and turning over of the installations to the customer.

The increasing volumes of installation work require an acceleration in the introduction of complete-unit installation of equipment at installations of the agroindustrial complex and deliveries of units and half-finished articles characterized by maximum plant readiness.

The use of this method is making it possible to reduce sharply the work schedules. For example, instead of one month, equipment is being installed in feed preparation shops in just 3 days, the assembly of milking units is being carried out by 3 mechanics in 4 days and installation at a facility -- by 5 workers in 2 days. In the process, labor expenditures are being lowered by a factor of 2.

The implementation of a special purpose program for further introduction of the large unit method of installation will make it possible to realize an economic effect in excess of 3 million rubles annually throughout the country as a whole and to reduce labor expenditures by 4.3 million hours, which is equivalent to the conditional release for other work of more than 2,000 highly skilled workers.

The chief task of installation and start-up and adjustment organizations is that of increasing the work volumes for the modernization and technical re-equipping of livestock husbandry, poultry raising and feed preparation installations. By the end of the five-year plan, they must constitute one half of the volume of contractual work concerned with the mechanization of livestock husbandry. In order to achieve this level, it will be necessary to develop on a more extensive scale the network of Agropromtekhproyekt organizations, which are responsible for developing the estimates documentation for the modernization, technical re-equipping and expansion of existing farms and complexes. A uniform technical policy in the mechanization of livestock husbandry and an acceleration in scientific-technical progress must be carried out through these organizations.

A commodity milk farm of the Kolkhoz imeni Dzerzhinskiy in Zhitomir Oblast can serve as an example of highly effective work in this regard. As a result of modernization work, the milk yield here increased by more than twofold (amounting to 36,000 quintals) with the same number of workers. The labor expenditures per quintal of milk declined from 10.5 to 2.5 hours and the production cost -- from 25.9 to 17.5 rubles.

Successes in the construction and modernization of livestock husbandry installations are for the most part dependent upon efficient work by the logistical supply service. It must ensure that the installations under construction or being modernized are supplied in a timely manner with all of the needed types of technological, electrical engineering and non-standard equipment, cable products, prefabricated structures and materials. The work of the supply subunits will in the future be inseparably associated with installation operations.

Under the conditions imposed by accelerated scientific-technical progress, greater importance will be attached to the efficient use of and support for the continuous operation of equipment. Thus there will be a general need for developing a production base for the technical servicing of the machines and equipment of farms and complexes.

At the present time, there are more than 65,000 farm stations at kolkhozes and sovkhozes and approximately 2,850 technical servicing stations and 20,000 mobile workshops at regional repair enterprises.

Approximately 200 specialized departments are servicing and repairing the equipment of large livestock husbandry complexes.

With the creation of Gosagroprom, favorable conditions have developed for organizing a single engineering-technical service in the rural areas and for raising the level of servicing for the machine-tractor pool.

Special importance is now being attached to work concerned with the introduction of and the implementation of further improvements in the system of planned-preventive technical servicing and repair and also to the construction, modernization and technical re-equipping of existing STOZh's /stantsiy tekhnicheskogo obsluzhivaniya oborudovaniya zhivotnovodstva; stations for the technical servicing of livestock husbandry equipment/ and farm points.

In addition to the centralization and industrialization of repair-servicing operations, the livestock husbandry farms and complexes of kolkhozes and sovkhozes must have at their disposal well equipped farm points and skilled personnel. The technical servicing stations and specialized enterprises must service and repair complicated equipment and carry out diagnostic work on the equipment.

During the years of the five-year plan, the plans call for the construction and modernization of approximately 50,000 farm points and 280 STOZh's and the development for them of more than 30 new types of equipment. In organizing repair and servicing operations, the collective contract and cost accounting procedures must be introduced into operations on an extensive scale.

The industrialization of installation operations is being carried out on the basis of a maximum transfer of the production operations from the installation to be installed to specialized procurement enterprises.

The general plan for the 12th five-year plan calls for capital investments which will make it possible to achieve a planned production volume for installation work of up to 300 million rubles annually and an industrialization level for the carrying out of installation work using the resources of specialized organizations -- of up to 40 percent.

If on the average each percent of increase in the level of industrialization ensures an increase in labor productivity for installation work of not less than 2.5-2.8 percent, then it is clear that this will make it possible for the entire increase in the volumes of installation work to be carried out by means of an increase in labor productivity.

At the present time, of 350 specialized procurement enterprises and installation product plants, there are approximately 130 enterprises which have production capabilities ranging from 0.5 to 4 million rubles. The installation organizations include in excess of 1,200 prombaz PMK's /mobile mechanized columns/, of which 400 are standard types.

The planning institutes, jointly with the branch institutes, have developed a parametric series in which the plans call for the construction of industrial bases for mobile mechanized columns with a work volume of 1.5 million rubles, technical servicing stations with capabilities of 0.25, 0.35 and 0.5 million rubles and specialized procurement enterprises and installation product plants having production capabilities of 1, 2, 3 and 4 million rubles.

For the carrying out of installation work and the start-up and adjustment and technical servicing and repair of machines and equipment, within the system for repair-technological equipment, the plans call for approximately 1,400 different items of technical equipment, of which approximately 1,100 are already being produced by industry. More than 300 types of special equipment and rigging for the fitting out of STOZh's and farm points, specialized procurement enterprises and installation product plants are being developed by VNIITIMZh and its TsOKTB /Central Experimental-Design and Technological Bureau/.

The carrying out of the tasks concerned with the introduction of this technological equipment will make it possible, during the current five-year plan, to ensure that the installation organizations and technical servicing services are supplied with special equipment and rigging in the required volumes.

Scientific support for the work being carried out by specialized enterprises in connection with the all-round mechanization of livestock husbandry is being supplied by VNIITIMZh, the union Orgsel'tekhmontazh Trust and the Rosagropromorgsekhmontazh Trust.

In the formation of technical policy for livestock husbandry, a leading role must be played by the scientific-research institutes for mechanization. There are more than 20 of them, including five which specialize in the mechanization and electrification of livestock husbandry operations.

A high level of livestock husbandry mechanization in developed foreign countries explains the existence there of a developed service system. A thorough study of the prospects for developing these services, generalizing and utilizing their achievements and combining scientific-production efforts in the interest of solving problems will be one of the most important prerequisites for achieving further mutually advantageous collaboration with Socialist Bloc countries and with other countries.

The decisions handed down during the 27th CPSU Congress enjoin us to achieve a radical turning point in our managerial methods.

The creation of a single apparatus for administering the livestock husbandry branch within USSR Gosagroprom and the interest of this apparatus in the production needs is making it possible to solve more effectively the problems associated with implementing a single technical policy.

Under the conditions imposed by an acceleration in scientific-technical progress, higher requirements are being placed upon the personnel, especially upon the leaders of agroindustrial associations. A keen appreciation for new developments, the ability to accept and persistently introduce highly effective items of

equipment into operations, the experience of production innovators, progressive technologies checked by science and practical experience and a desire to study and teach efficient methods to others -- this then is what distinguishes a modern leader and specialist.

A turning point must be achieved in the operational style of all engineering and technical workers and they must be oriented towards the most important aspect -- accelerating scientific-technical progress on the farms and complexes and ensuring a worthy contribution towards the carrying out of the Food Program.

7026
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TRACTOR MINISTER ON STREAMLINING CAPITAL CONSTRUCTION

PM131203 Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Sep 86 p 2

[Unattributed account of speech by A.A. Yezhevskiy, USSR minister of tractor and agricultural machine building, at 20 September CPSU Central Committee conference on capital construciton under the general heading "Constructing Rapidly, to a High Standard, and Economically--This Must Be the Law for All Participants in the Construction Complex": "Difficult Path of Remodeling"]

[Text] In the 12th 5-Year Plan the Ministry of Tractor and Agricultural Machine Building has a complex and intensive program to fulfill. Suffice it to say that we have to develop and, most importantly, put into production over 380 models of new machines, and by 1990 we have to increase the proportion of machines in production which are in line with world standards to at least 80 percent, and the proportion of machines newly assimilated and developed to 100 percent. Moreover the equipment being created and modernized must be 1.5-2 times more productive and 2-3 times more reliable than that being produced today. In order to fulfill such complex tasks, we must renew production capital, remodel 147 existing enterprises, and build a number of new plants on a modern technical basis.

The ministry is carrying out a number of specific measures to improve the work of all links of capital construction. The expert examination and review of projects for retooling, remodeling, and constructing enterprises is continuing. The first stage in this important work enabled the state of planning in the sector to be critically assessed. Suffice it to say that out of 102 plans examined only 26 were confirmed as being in line with modern technical standards. The new stage is being carried out on the basis of considerably increased requirements and normatives. Planning institutes have analyzed and reviewed the time estimates given for constructing installations. With this aim in view, given the need to take account of the recommendations of the Bank for Financing Capital Investments, the elements of all startup complexes are being reviewed and proposals are being submitted to mothball the construction of individual installations.

However, even today, a month after the adoption of the new decisions, signs of certain negative phenomena have appeared in relations between clients and contractors, and in our opinion a barrier must immediately be erected against this. Despite the agreements already reached under the set procedure with the

former contracting ministries and the USSR Gosplan for volumes of work for 1987, which meet the sector's needs for creating new capacities, signs of parochialism are already emerging in efforts to revise these volumes by agreement with the new construction ministries. Thus, for example, the Ministry of Construction in Southern Areas of the USSR refuses without good reason to remodel the Krasnodar "Oktyabr" Plant, and that means that the output of highly durable cast iron for hydraulics production will not be ensured in the sector. It is also proposed to mothball the construction of the Volgograd Motor Plant, although the client on this site has everything--space, documentation, and equipment. In this case, one might ask, how are we to switch the Volgograd Tractor Plant to production of the new "Volgar" tractor?

/8918
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IZVESTIYA ON NEED TO IMPROVE FARM MACHINERY

PM141051 Moscow IZVESTIYA in Russian 11 Nov 86 Morning Edition p 1

[Editorial: "Reliable Equipment for the Coutnryside"]

[Excerpts] Despite very complex weather conditions the farming year has proved fruitful this year. The gross grain harvest, for instance, will total around 210 million metric tons. This success is no accident. The economic methods of management, which are based on cost-cutting measures, financial autonomy, the collective contract, and production intensification, are beginning to bear fruit.

At the conference with agricultural machinery designers, scientists, and enterprise, ministry, and department leaders held at the All-Union Scientific Research Institute for Agricultural Machine Building 4 November, M.S. Gorbachev said that now that agricultural workers have had a taste and sensed the urgency of the utilization of intensive techniques in both crop farming and livestock raising, they have begun to pose the questions raised by the introduction of intensive techniques with particular exactingness. These questions encompass a whole range of problems but they concern machinery above all.

The decisions of the 27th CPSU Congress and the CPSU Central Committee April (1985) and June (1986) Plenums clearly define the range of machine builders' tasks in enhancing the standard of the technical equipment of the country's agro-industrial complex.

Machine builders have in recent years improved the supplies of machinery, equipment, and spare parts to kolkhozes, sovkhozes, and agro-industrial complex processing enterprises. However, we can no longer console ourselves with the fact that we produce a lot of machinery. The trouble is that much of it soon breaks down. The implementation of the program for the radical renewal of machine building is lagging in some areas. As yet there is a lack of machinery for cultivating staple agricultural crops by means of intensive techniques and mechanizing labor in livestock raising.

During the last 5-year plan, for instance, the Ministry of Tractor and Agricultural Machine Building and the Ministry of Machine Building for Animal Husbandry and Fodder Production put into production only one-third of the planned quantity of new machines, and even these machines are produced in

small series at a few enterprises. The fact that 35 percent of all labor expenditure in crop farming is used in growing cotton, sugar beets, feed root crops, grapes, vegetables, and potatoes, that is, crops which account for only 10 percent of arable land, can also only be explained by the absence of the necessary machinery.

At the same time some 50 percent of the machinery produced by the Ministry of Tractor and Agricultural Machine Building and more than 30 percent of the machinery produced by the Ministry of Machine Building for Animal Husbandry and Fodder Production is obsolete. Naturally, these machines to not match world standards and do not meet machine operators' growing demands.

It cannot be said that the machine builders have nothing to put into production. What is surprising is the substantial number of new designs of tractors and other machinery which have been tested and recommended for production and yet failed to reach the production line.

Machine builders have still not overcome the unjustified abundance of different makes of machinery with an extremely low degree of standardization of units, assemblies, and components. Little use is made of modular principles, means of automation and control, and hydraulic drives in machine design, that is, of design solutions which represent the mainstream of rapid scientific and technological progress. Questions of the final assembly of machinery and of repairs and technical servicing by the manufacturer remain acute.

And as for the manufacturing quality, it beggars all description! Hero of Socialist Labor M. Klepikov, a comprehensive team leader on Krasnodar Kray's "Kuban" Kolkhoz relates: "We take delivery of, for instance, a new combine harvester bearing the Seal of Quality. Yet we are forced to take it to pieces and reassemble it in our workshop. And that applies to all machinery regardless of make." According to machine testing stations, on one in three machines the indicators for the reliability and readiness for use of machinery are below those set by the technical norms.

Ministries, plants, and raw material and subassembly suppliers must seriously prepare for the introduction of state acceptance of output. At the "Gomselmash," for instance, where such acceptance has been introduced on an experimental basis, a critical situation was revealed--9 of 10 machines did to meet the technical conditions.

Machine builders have a great deal of work facing them. However, it must be said that they cannot cope with all the tasks alone, without the help of their colleagues in allied industries, that is, metalworkers, chemical industry workers, electrical equipment industry workers, and construction workers. Many of these regard the orders of agricultural machine builders as of secondary importance. And that despite the fact that it is more than obvious that the road toward a steep upsurge in the country's economic efficiency depends directly on the state of affairs in the agro-industrial complex.

This area is also one of the main avenues of scientific development. Quite good [neplokhoy] groundwork has been carried out for the integration of science with machine building, the creation of a new production base in machine

building, and the development of new machines. However, these processes need to be accelerated. The contribution of certain scientific research establishments is so small that their impact on scientific and technical progress is virtually nonexistent. Largely ignorant of the needs of the countryside, such scientific collectives treat the technical creations of resourceful agricultural workers with contempt. And yet these creations are the outcome of urgent day-to-day needs. There are many valuable ideas in the storehouse of collective wisdom of the homespun inventors.

And there is another point which neither the machine builders, nor the State Agro-industrial Committee [Gosagroprom], nor the local authorities must forget. While developing new equipment, every effort must be made to organize the training of machine operator and repair worker cadres and provide the necessary technical facilities for housing, technical servicing, and repairing these machines and mechanisms.

Only enterprising work in all areas, and above all in the key area of scientific and technical progress, can ensure a decisive breakthrough in the country's agricultural sector and the achievement of the targets outlined by the 27th CPSU Congress and the Food Program.

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PAPER INDUSTRY TECHNOLOGY LAG DISCUSSED

Moscow LESNAYA PROMYSHLENNOST in Russian 4 Oct 86 p 2

[Article by S. Litvinov, V. Sokolov, and A. Suturin: "When Will the Chase After Imported Equipment for the Paper Industry End?"]

[Text] "I must say that in degree of complexity, a paper-making machine is slightly higher than a rolling mill," noted Academician B. N. Laskhorin during a brief digression from the reading of his report.

"You exaggerate, Boris Nikolayevich," responded another academician, an outstanding specialist in the field of metallurgy, who sat not far away.

This exchange of remarks by two venerable scientists, which was held at the plenum of the All-Union Council of Scientific and Technical Societies, is not recalled by accident. Such a scornful opinion of paper-making machine building exists even in scientific circles at the highest level. Meanwhile, even in "Das Kapital" Karl Marx noted that, when the paper-making machine was developed, bourgeois society of the 19th century utilized all the most advanced machines at its disposal. Today this arsenal has not become simpler. No wonder big Western firms do not dare to manufacture paper-making machines on their own. Possessing the "secret" of some important unit, firms buy accessories in other countries. For example, the British Beloit Firm possesses the first pressure box of the turbulent converflow type. The Finnish Valmet and the Austrian Foyt have developed their own original pressure boxes. However, the Custers Firm manufactures the best rolls with a regulated deflection. AccuRay and Measurex have a monopoly on automatic paper units. Of course, each of these and other firms producing equipment for paper-making and curing lines keeps its secrets under lock and key, but is pleased to sell any units and parts to our country. They are not cheap. If we take into consideration the fact that the bulk of the machine pool of the domestic paper industry requires replacement or modernization, it will become clear that the sector's renovation by means of imported machines will cost a tidy sum.

Therefore, in accordance with a party and government decision the establishment of an internal machine building base capable of solving major problems in the sector was begun in our country in the early 1960's. Reading

the report by G. M. Orlov, first deputy chairman of the USSR Gosplan, which he made at the All-Union Conference of Pulp and Paper Industry Workers in 1961, one involuntarily notes how correctly the situation was evaluated at that time, a quarter of a century ago, and how correctly the development path for the sector was chosen.

It seems that a great deal has been done since then. As foreign specialists maintain, the most powerful paper-making machine building plants in the world have been built in Petrozavodsk, Ustinov, and Dnepropetrovsk. However, there is a paradox: One can hardly find their machinery and equipment at paper industry enterprises. The fingers of two hands are sufficient to count domestic high-speed machines made in these three cities. What is the matter? Machine builders answer this question with the following question: "Where are new developments?" Directors of the Central Scientific Research Institute of Paper-Making Machine Building: "Where is new technology?"

In fact, where? Let us recall that the task of developing a domestic wide-format high-speed machine with a trim width of 6.72 mm and a working speed of up to 760 meters per minute for the production of 330 tons of newsprint in 24 hours was set for the Central Scientific Research Institute of Paper Machine Building as long ago as 1960. Such a machine of the B-15 mark was designed 2 years later. It was installed at the Kondopoga Pulp and Paper Combine only in 1976, because the construction of the building was disrupted constantly. Later it turned out that it was impossible to attain the planned output at it. Thus, directors of the then Ministry of the Paper Industry had a trump card in their hands: the "inability" of designers and machine builders. Workers at the Ministry of the Paper Industry attained a revision of the program, which envisaged the manufacture of seven machines of this category. The "sisters" of the Kondopoga B-15 never came into the world.

Another attempt to develop a modern paper unit, but of a new generation, was made in the early 1980's. A turbulent-type pressure box and a double-grid forming device were supposed to become the basic subassemblies of this machine. Jointly with the Leningrad Technological Institute of the Pulp and Paper Industry and the All-Union Scientific Production Association of the Paper Industry the institute, after the development of the design, issued the method of calculation and recommendations for the planning of a pilot machine. It was installed at the Zhidachov Pulp and Board Plant as... an industrial line. A paper production plan was given for the machine. The machine was put into operation at the end of 1982. However, instead of higher-count letterpress paper only the production of wrapping paper could be set up on it (only after the obviously inoperative turbulent-type pressure box was abandoned and replaced with its old design did the machine reach the designed speed of 580 meters per minute and begin to produce letterpress paper No 2). In other words, the attempt to skip the entire phase of development of a new unit--the pilot phase--again did not succeed.

But then the sector's managers--at first N. N. Chistyakov, former USSR deputy minister of the paper industry, and then deputy ministers G. F. Pronin and N. G. Nikolskiy--got the opportunity to more confidently demand purchases of machines abroad. To be sure, it was more pleasant to cooperate with foreign firms. They demanded nothing--neither developed technology, nor help in its

adjustment--from paper industry workers. They installed a turnkey machine. In addition, they gave substantial warranties and, when necessary, eliminated defects at their expense. Cooperation with foreign partners is good in every way. One thing is bad: One has to pay a gold ruble for it.

However, another thing is no less regrettable. Not relieving the developers of new equipment (Central Scientific Research Institute of Paper Machine Building) of the blame for the fact that the first pancakes turned out lumpy, it must be stated openly: With such a practice the partners of paper industry workers from the Ministry of Chemical and Petroleum Machine Building have literally driven the Ministry of the Pulp and Paper Industry and then also the Ministry of the Timber, Pulp and Paper, and Wood Processing Industry into a corner. After all, they could make the second machine more refined, the third, good, and the fifth, competitive only if they received new orders. However, there were no orders for high-speed machines.

An all-Union scientific and practical conference "Increase in Production Efficiency and Improvement in the Quality of Newsprint During the 12th Five-Year Plan" was held in Solikamsk at the beginning of this year.

"What do you offer us?" Managers and specialists of pulp and paper enterprises asked representatives of the Central Scientific Research Institute of Paper-Making Machine Building and Machine Builders this question. An intelligible answer did not follow. However, it became clear: The work of designers and machine builders for the sector is being curtailed gradually. Papermakers with a long record of service remember that, previously, the Main Administration of the Pulp and Paper Industry existed in the structure of the Ministry of Chemical Machine Building. Its functions have now been transferred to the Soyuzpolimerbummash Association. The trouble is not that paper has ended up in second place after polymer, but that one-half of the load of orders of this association's enterprises, established as a paper industry base, are non-related orders. The work of the Central Scientific Research Institute of Paper-Making Machine Building is based on the same principle.

In brief, what is stated in the materials of the 27th CPSU Congress has happened: "The unrestrained chase after imported equipment and technology, which has gripped many managers, has a corrupting effect on collectives of developers. Seeing how easily equipment is purchased abroad, in essence, their ardor is dampened, they lose their high enthusiasm for work, and give in to difficulties."

There is no question that the lack of orders from paper industry workers for powerful modern machines is a serious, but not the only, hindrance in the work of the collective of the Central Scientific Research Institute of Paper Machine Building. The fact that during one-quarter of a century the institute has virtually not established a single paper-making machine capable of competing with modern foreign models is also due to another reason. THE INSTITUTE DID NOT AND DOES NOT HAVE A PILOT BASE FOR TESTING ITS DESIGNS (a small step in this direction was made only a year ago. A stand for testing the design of a hydrodynamic pressure box was installed at the Arkhangelsk Pulp and Paper Combine). The problem of the establishment of such a base was

discussed several times by specialists of our ministry and of the Ministry of Chemical and Petroleum Machine Building, but everything was in vain. Besides, the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry sees no problem. In an answer to one of the articles in our newspaper L. V. Grebenev, deputy chief of the technical administration, expressed the following opinion: "Individual subassemblies of paper-making machines can be tested when there are orders for modernization. Time can always be provided for this. However, it is impossible to establish special experimental bases for all cases." V. Ye. Alekhin, another deputy chief of the technical administration, is also in full agreement with him. We ourselves will not argue with specialists, who have a considerable influence on the ministry's technical policy. We will cite only the opinion of those who encounter new equipment in practice. For example, this is what P. F. Belogurov, general director of the Belbumprom Association, writes to the editorial department: "The association supports the idea of the need to strengthen the experimental base of the Central Scientific Research Institute of Paper-Making Machine Building, because at present the prototypes of equipment delivered to industrial enterprises, as a rule, do not reach the planned indicators and require further substantial technical improvements." O. A. Patsatsiya, general director of the Gruzbumprom Association, supports his colleague: "For the establishment of high-speed paper machines the Central Scientific Research Institute of Paper Machine Building without fail should have a modern scientific-experimental base at its disposal."

Scientists working for the paper industry also fight for it. Let us turn to the book "Tekhnologiya Formovaniya Bumagi i Kartona" [Technology of Paper and Board Formation] by A. S. Smolin and G. Z. Akselrod, which was published in 1984. Examining the designs of overlapping devices, on which, as we know, workers at the Scientific Research Institute of Paper Machine Building have "stumbled," they write that the technological process is quite complex and it does not seem possible to definitively formulate even its basic patterns. Therefore, a significant number of experimental facts and their generalizations play their positive part.

THUS, AS SPECIALISTS CLOSER TO MACHINE BUILDING THAN MINISTRY WORKERS MAINTAIN, ONE CANNOT DO WITHOUT NUMEROUS EXPERIMENTS. However, the collective of the Central Scientific Research Institute of Paper Machine Building is deprived of such an opportunity. With respect to experiments under the conditions of existing production, as life has shown, they are not very effective.

It seems, however, that the lack of a scientific-experimental base is also the result of the position held by the leadership of the Central Scientific Research Institute of paper-making machine Building.

"We have no funds for raw materials, nor paper specialists," we were told by S. V. Lavrenov, deputy general director of the Lenbummash Scientific Production Association, and associates at the head institute. "With the establishment of such a base a new sector appears at the Ministry of Chemical and Petroleum Machine Building. You understand that no one will go for this."

Is this not why the problem of the transfer of the Factory imeni Gorkiy to the Leningrad Technological Institute is now being solved? However, this will be the base of the Forestry Engineering Institute of the USSR Ministry of Higher and Secondary Specialized Education, not of the Central Scientific Research Institute of paper-making machine Building and of the All-Union Scientific Production Association of the Paper Industry.

What is the way out? And is there one? There is. It is suggested by specialists of pulp and paper enterprises, at which the equipment developed within the walls of the Central Scientific Research Institute of Paper-Making Machine Building has been mastered. The essence of their suggestions is as follows: It is necessary to place the Central Scientific Research Institute of Paper Machine Building under the authority of the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry and to unite it with the All-Union Scientific Production Association of the Paper Industry, which includes several enterprises, and with the State Institute for the Planning of Pulp and Paper Industry Enterprises. Then scientists will be able to issue the developed plans of modern machines to machine bulding enterprises of the Ministry of Chemical and Petroleum Machine Building. Moreover, taking into consideration the fact that specialists of several ministries, including the Ministry of the Electrical Equipment Industry, the Ministry of Instrument Making, Automation Equipment, and Control Systems, and the Ministry of the Textile Industry, participate in the development of such machines as partners with equal rights, it is necessary to establish an intersectorial scientific and technical complex. It is needed primarily so that developments based on orders of paper industry workers, as well as the output of accessories and parts, are carried out in a planned manner.

Studying the problem and talking with dozens of people connected with it in one way or another, the authors of this article have encountered a curious fact. Managers and specialists of paper industry enterprises are for the establishment of a single powerful scientific and technical "kulak" for the sector and ordinary designers and laboratory directors, as well. However, as soon as one talks to executives at the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry, on whom the solution of this problem depends, the same types of answers follow:

"We will buy licenses from foreign firms and nothing else is needed," V. Ye. Alekhin, deputy chief of the technical administration of the USSR Ministry of the Timber, Pulp and Paper, and Wood Processing Industry, said.

"There is no cause for concern," N. A. Kotkov, chief of the technical division of Soyuzpolimerbummash, echoed him.

These answers are typical. At the recent all-Union conference of heads of social science departments held at the CPSU Central Committee it was stated that the recent loss by some of our scientists, engineers, designers, and specialists of a sense of professional pride and desire to grasp everything

with their own minds was of great concern. The craze of "purchases by import" became widespread, as though nature had no other method of ensuring technical progress.

This is the force of inertia in thinking. But the price of this inertia is high. During a quarter of a century the paper industry has not succeeded in relying on domestic machine building. Today 80 percent of the pool of paper and board machines consists of old machines, which have been in operation for more than 30 years. No currency reserves are sufficient to rejuvenate them.

11439
CSO: 1824/42

VASHCHENKO NOTES STRENGTHS, WEAKNESSES OF TRADE SECTOR

Moscow ARGUMENTY I FAKTY in Russian No 34, 19-23 Aug 86 pp 1-3

[Interview with USSR Minister of Trade G. I. Vashchenko by A. Loginov: "Trade: Paths for Renovation"]

> [Text] In the party's social policy, fundamental importance is attached to the most complete satisfying of the public's effective demand. In the resolution of this task, an active role is assigned to trade.
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> What is being done to improve the trade services provided to the workers? Our correspondent A. Loginov has a discussion on that topic with USSR Minister of Trade G. I. Vashchenko.

[Question] Grigoriy Ivanovich, our discussion will be a frank one. Therefore, please forgive me if my first question will seem to be not one of the generally accepted ones. Why is it that people still have to stand in line so often, even when the items are not scarce?

[Answer] Yes, we have lines, especially in the major cities. What are the causes? First of all, the network of stores is insufficiently developed. Then one sees the effect of shortcomings in the organizing of labor, breakdowns in the operation of the equipment, and poor discipline in a specific store, since the country has hundreds of thousands of them, mostly small-scale ones employing only a few people. Of course, the shortage of a number of commodities also takes its effect.

At the present time, relying upon the experience of the cities that are advanced in this regard -- and much has been written in the press about that experience -- we are introducing a comprehensive, progressive technological scheme for moving commodities. The essence of that scheme consists in producing the commodities in the form that is best prepared for sale, previously wrapped and packaged in packaging equipment, and delivered in accordance with an hourly schedule directly to the sales floors at the stores. Special dispatch services are being created, and they will rely on the use of the most up-to-date computer technology.

As for the most crowded places in major cities, where one can see lines most often, there will be an increase in the number of trade and public-nutrition enterprises. And especially small ones. For those purposes areas on the first floors of apartment buildings are being organized more and more frequently for serving the public, and small-scale retail trade is being organized on the sidewalks themselves. By reciprocally supplementing one another, the large-scale stores and the small-scale trade locations will guarantee the improvement of the trade services provided to the public.

[Question] You have said that the number of stores will grow. Could you give a few more details about that?

[Answer] The tasks confronting the branch today are very large and, to a large extent, new. The increase in retail commodity turnover will be 33.5 percent, as compared with the 16 percent in the 11th Five-Year Plan. There will be a noticeable expansion in the network of stores. The growth of that network will exceed by a factor of 2.7 times the rates of the previous five-year plans. A course has been taken for the construction of large-scale stores with a broad variety of commodities. Those stores will be located primarily in large-scale housing areas. The sale of essentials of life will be concentrated there.

But the sale of wardrobe articles and complicated technical commodities will continue to be conducted in large-scale specialized stores catering to the needs of the entire city. In those stores it is possible to guarantee the greatest completeness of the variety and to offer the customer the related commodities and additional services, including those involving the installation of complicated appliances at home, their delivery, adjustment, etc.

Special attention is being devoted to the development of self-service department stores.

Obviously, all this will supplement the development of other forms of trade: the selling of commodities on the basis of prior purchase orders by the public, with the items to be delivered to the home; mail-order trade; the development of the small-scale retail network; and sale by means of coin-operated vending machines, especially in recreational areas, at train stations, or wherever this is convenient for people.

It must be emphasized that the further development of trade is linked primarily with the saturation of the market with the high-grade commodities that people need. Today the wardrobe of the average statistical inhabitant of our country includes approximately 20 items, including 6-7 pairs of shoes. And yet one observes today in the trade network a shortage of individual items, especially for children and elderly people.

With a consideration of the specific needs of definite groups of customers, the trade system is preparing the purchase orders for the production of commodities.

As a result of the fulfillment of the Comprehensive Program for Developing the Production of Consumer Goods and the Personal-Services System in 1986-2000, within the next few years the shortage of basic commodities, especially those in mass demand, will definitely be overcome. That shortage is already being overcome. Therefore there has been an increase in the importance of well-organized trade, and that has been the object of the measures being carried out in the branch to develop the material-technical base, to improve the economic mechanism, and to increase the responsibility and independence of the collectives at the trade and public-nutrition enterprises.

[Question] The party has taken a course aimed at the uncompromising fight against drunkenness and alcoholism. The sale of wine and vodka products is being reduced. This has given the trade workers complicated tasks in restructuring their work. How is this work being carried out? Is the income from the sale of alcoholic beverages taken into consideration in the commodity-turnover plan?

[Answer] In conformity with the decree issued by the party and government with regard to the fight against drunkenness and alcoholism, we have begun to sell smaller quantities of alcoholic beverages. For example, in 1985 the sale of alcoholic beverages was reduced by 18 percent, including 14 percent for the sale of vodka and vodka-liqueur items, 17 percent for grape wine, 10 percent for cognac, 10 for champagne, and 29 percent for fruit and berry wines. The tendencies toward the reduction of sales of these beverages will continue in 1986.

When summing up the results, consideration is taken not of the income, but the sale of commodities. In 1986, when planning the commodity turnover, a determination was made of the overall volume, including the volume without the sale of alcoholic beverages, but starting in 1987 the volume of commodity turnover will be established without taking their sales into consideration.

As of the beginning of 1986 the number of stores selling alcoholic beverages dropped by 129,600, and 40,000 stores were respecialized, half of which currently sell juices and other nonalcoholic drinks.

We have taken steps to make up the losses resulting from the reduction in the sale of alcoholic beverages. The losses have been successfully compensated in Lithuania, Latvia, and Estonia. But in other places the measures have proven to be insufficient.

There has been increased work to expand the network of stores selling commodities intended for organizing the public's recreational time. During the second half-year of 1985 alone, 60 "Do It Yourself" stores opened up in cities. "Commodities for Sports and Tourism" and "Commodities for Orchard and Garden" stores are opening up everywhere, especially in Belorussia, the RSFSR, and the Ukraine. The network of these stores will receive further development in the 12th Five-Year Plan.

[Question] Haven't you had the occasion to observe a very young salesgirl speaking to customers in a coarse, disrespectful manner? Why is that? What is being done to combat it?

[Answer] Yes, I've observed that and rather frequently... I think that this is primarily a matter of a shortcoming in education, and sometimes it is on both "sides."

At the present time the trade system has a severe shortage of workers in the mass occupations, especially sales persons. The reasons for this situation, I hope, are obvious: the work in many stores is tiring, the articles have to be carried manually, and therefore the occupation of sales person is losing its prestige value. Not infrequently the people who are hired at stores are people who are not completely trained, and that is why conflicts arise...

The improvement of educational work and cadre training at PTU [vocational-technical schools] and technikums is supposed to correct the situation that has been created. One of the important levers for improving the selection and assignment of cadres is the certification process. In the past two years, 286,000 persons have been certified, of whom 2500 were found not to meet the requirements of the position occupied, but 11,000 workers were promoted.

At the present time we are developing measures to retrain specialists and administrators at all levels and are reconsidering the curricula at educational institutions and in various courses.

[Question] How is the trade system studying the customers' demand? Does this help in the fight against overstocking with unwanted output and in eliminating shortages?

[Answer] At wholesale bases, at torgs, and in large stores, special market-study services are in operation. They conduct planned observations to determine the need for commodities and to substantiate the requisitions and purchase orders.

Recently the trade system has begun to study the customer himself more. It has become a broader practice to conduct surveys, to arrange sale exhibits, to demonstrate innovations, and to conduct customer conferencies and other similar measures. That helps to get a better sensation of the market pulse and to become aware promptly of the changes in the customers' wants. In the 12th Five-Year Plan there will also be a noticeable broadening in the use of electronic computers in order to account for the movement of commodities and to study the public's wants.

But we are not limiting ourselves to studying only the "current" changes in demand. Our scientific-methodology center for this problem -- VNIIKS -- is developing long-term forecasts of demand and commodity turnover, correlated both with the development of scientific-technical progress in the production of commodities and with the norms for efficient consumption.

However, everything is not yet running smoothly in this matter. The situation can be described as follows: the demand is being studied, but still much is being done without any demand. The materials concerning changes in demand, which we send to industry, frequently are viewed as food for thought, rather than as a guide for action or for increasing the production of the popular

commodities, improving their variety, or improving their quality. And this discourages some of our specialists. They lose the taste for broadly studying the demand, and orient themselves more toward studying only the ups and downs of the market situation, since at the present time the importance of that work is sharply increasing. But what is need both of trade and of industry is the sruly flexible and prompt adaptation to the changes in the public's demand.

The recently adopted steps to improve the economic mechanism, including those pertaining to the interrelationships between the trade system and industry, greatly increase the responsibility that the trade organizations bear for the correct determination of the needs in the purchase orders. But at the same time there is also an increase in the responsibility borne by the suppliers for the complete and precise fulfillment of the contracts.

Consequently, the study of the demand and the conducting of business with a consideration of the changes in that demand must be carried out both by those who produce the commodities and those who trade in them. To do this, a nationwide system is being created to study and, let me emphasize, form the public's needs and demand for consumer goods and services. In this work, USSR Ministry of Trade is assigned one of the leading roles.

The total volume of retail commodity turnover in state, cooperative (including public nutrition), and kolkhoz trade in 1985 came to 332.7 billion rubles (in actual prices).

As of the end of 1984, 7,592,000 persons worked in the country's retail-trade and public-nutrition enterprises.

Leningrad cooking specialists saved visitors 26 million hours as a result of the creation in the city of a network of specialized fast-service enterprises.

Increase in the sale of food products in state and cooperative trade, including public-nutrition enterprises (in comparable prices; 1940 = 1):

1960	1970	1980	1985
2.7	5.0	7.3	8.7

5075
CSO: 1827/159

PRICES FOR EXTRACTION, SALE OF DONBAS COAL

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 9, Sep 85 pp 57-60

[Article by M. Zagumennov and N. Sokolova, candidates of economic sciences: "Tendencies in the rise and fall of coal mining prices in the Ukrainian SSR and some problems in setting coal prices"]

[Text] Coal mining is one of the basic branches of our economy. The directives and especially the CPSU Central Committee and USSR Council of Ministers decree "On increasing rates of charge and official salaries and improving the organization of workers in the coal industry and slate industry and mine construction" (1981) and other such documents name measures to be carried out for further technical equipment of the coal mining industry, means of improving self-financing mechanisms and pay raises for miners.

The Don Basin is one of the coal basins that covers much of the European USSR's demand for fuel and energy. Therefore, it has become quite important to study tendencies in the rise and fall of production costs and profits of the coal-mining industry in the Ukraine and to assess the individual factors that determine that region's coal-mining costs.

As a result of the 1967 reform of wholesale prices, profit loss in the coal-mining industry of the Ukrainian SSR was eliminated. On the average, the level of profitability of coal mining throughout the republic in 1968 was 14.4 percent of the production costs and 8.3 percent of the production funds. Every ton of mined coal produced 1.83 rubles of income which generally made the work of the coal mines profitable. In subsequent years, the profitability of coal mining by the Ukrainian SSR Ministry of Coal Industry continually dropped because of deteriorating coal quality and increased production costs.

The basis for the plan for new wholesale coal prices in 1982 was the standard production cost for coal mining according to the 1979 plan. This is very significant in analysis of the actual economic indicators of the Ukrainian SSR's coal mining industry under the utilization of new wholesale coal prices.

Natural, organizational and technical factors have an influence on changes in the cost of coal mining. Natural factors include seam thickness and depth and other geological characteristics such as the categories of rock burst and

sudden explosions, seam ash and gas content, temperature, water content, hardness of rock formations and the condition of workings, etc. The second group of factors includes the degree to which production potential is exploited, how much planned production quotas are met, labor organization and pay, observance of standards for material consumption, organization of socialist competition and the use of advanced techniques.

For the geological conditions of its mines, the Donbass is characterized as one of the most complicated coal basins in the country. More than 70 percent of the coal is concentrated in seams of up to 0.9 meters in thickness. In addition, the seams thicker than 1.2 meters are most intensively worked (they produce 45 percent of the total coal output) but such seams make up only 1.7 percent of the total coal resources. This makes it necessary to begin working thinner seams. Since 1971-73, more 0.9-1.2 meter seams have been mined using Donbass and KMK-97 complexes and therefore, the percentage of coal mined from seams of up to 1.2 meters in thickness increased from 25 to 49 percent. As demonstrated by the rising average depth of mining from 538 meters in 1975 to 608 in 983, the output of coal from deeper seams has also increased.

According to our calculations, the total influence of natural factors on the rise in coal mining costs in the Ministry of Coal Industry of the Ukrainian SSR from 1976 to 1981 is somewhere on the order of 2.65 rubles/ton which amounts to more than half of the increment in specific costs. This means that with all the influence that objective (natural) factors have on the increase in coal mining costs, a substantial cause of the increasing costs has been organizational and technical (subjective) factors.

One of the basic organizational and technical factors that has had an ever-increasing influence on the growth in production costs per ton of coal in the Ukraine is the poor use of existing coal-mining resources because of shaft failures and equipment breakdown, a poor supply of spare parts for basic equipment, delays in the inspection of mining equipment, etc. The level of assimilation of established coal-mining resources in the Ukraine was 97.5 percent in 1979, 93.6 percent in 1980, 89.7 percent in 1981, 95.3 percent in 1982 and 95.7 percent in 1983. The poor use of resources naturally resulted in failures to meet the coal mining plan and according to our calculations, this caused specific costs to go up some 1.75 rubles/ton from 1976-1981.

One of the factors that has had a negative effect on the costs of coal mining in the Ukraine is the level of personnel overemployment. Thus, while the yearly coal output in 1981 dropped 11 percent from the 1975 level, the planned number of mining personnel was exceeded by some 1.5 percent and for that reason, the average increase in mining costs in 1976-1981 was 0.18 rubles per ton of mined coal. The average yearly overrun of actual material, fuel and energy costs for 1976-1981 was 0.14 rubles per ton of mined coal or 0.9 percent of the full costs for 1975.

Due to the influence of all organizational and technical factors, the production costs for coal mining in the Ministry of Coal Industry of the Ukrainian SSR went up 25 percent from 1976-1981.

Therefore, as a result of the introduction on 1 January 1982 of new wholesale prices for coal, the average price per ton of all grades of mined coal rose substantially. The greatest price increases were for anthracite (104 percent) and the lowest was for D-grade coal (37.9 percent). It was planned that each ton of mined coal would compensate for the costs and provide an income of about 3.14 rubles and with the mines freed from having to make payments into production funds, this would ensure a profit. However, the actual figures for the Ukrainian Ministry of Coal Industry have shown that regardless of the substantial (61.2 percent) increase in wholesale prices, coal mining in the republic has not been profitable. The average level of yearly profit loss for 1983 was 19.8 percent of the production costs with fluctuations between the various grades ranging from 7.9 percent for lignite to 35 percent for D-grade coals. This was caused by the unforeseen effects of objective and subjective factors due to which the absolute magnitude of growth in per-ton production costs considerably exceeded the absolute value of the increase in wholesale coal prices.

With regard to the recalculation of material costs following the new wholesale prices, the cost of mining one ton of coal in the Ukraine increased 15.3 percent in 1982. A large portion of the general increase in mining costs (14.0 percent) was the result of factors beyond the range of ministry influence. The allocation of funds to increase worker wages in the coal industry and an additional increase in the planned number of workers in this industry caused nearly half of the increase in production costs for that year. The increased production costs were also caused by changes in the prices of necessary auxiliary materials, fuel, electrical energy, etc. This factor comprised 33.8 percent of the rise in production costs for that year. Therefore, the actual increase in coal mining costs caused by increased prices and rates for needed materials and energy turned out to be twice as high as expected when the new wholesale prices for the republic's coal were planned. In 1982, funding and energy costs respectively comprised 4.7 and 3.7 percent of the increase of coal mining costs.

Organizational and technical factors comprised 13 percent of the rise in coal mining costs in 1982. This group of factors includes the failure of a large number of mines to meet their production quotas, poor utilization of production potential, excessive numbers of personnel, over-consumption of materials, fuel and electrical energy. Along with this, quantitative evaluation of the influence of individual organizational and technical factors has substantially changed.

The poor use of production resources has played a fundamental role in increasing costs. The frequent malfunctioning of mining equipment has had a strong effect on the use of these resources. The basic cause of these frequent breakdowns has been the poor quality of the equipment and a poor supply of spare parts. The shortage of spare parts for mining equipment reached a value of four million rubles for the year in question.

If we sum up the changes in the costs of mining one ton in the Ukrainian Ministry of Coal Industry in 1982, we can make the following conclusions. First, there was a relatively high overall increase in production costs over that one year. Secondly, a large portion of this increase was the result of

objective factors including increased prices and worker salaries. Thirdly, the influence of the group of factors which for the most part depend on the work of the ministry may be somewhat less than the first group, it does cause production losses which in turn increase the industry's delay in coal production and decrease its profits. Quick action to eliminate the causes of these losses is one of the chief tasks facing the industry.

The ash content in produced coal has had a strong effect on the poor profits of the Ukrainian coal mining industry. In 1982, it went up 0.9 points over its 1981 level and 0.5 points over the established standard. The increased ash content lowered the wholesale price per ton by 2.2 percent and the ministry therefore lost 48 million rubles. All of this has increased the loss of profits and reduced the efficiency of self-financing.

Because of the effects of all of these factors in 1979-1982, the new wholesale prices for coal (which were raised in the Ukraine by 61.2 percent) did not solve the problem of poor profits in coal extraction, but only lowered its level by almost a factor of two. Analysis also shows that were unplanned losses not allowed, it would be possible (allowing for reserves created by observance of ash content standards) to compensate for the negative influence of natural factors.

Considering the reduction of the influence of the external inflationary factor, the introduction of new wholesale prices for industrial production and the reduced influence of the one-time wage increases as well as the use of intra-industry reserves, in 1983, it was expected that production costs would stabilize at the preceding year's level and that this would create some basis for better self-financing. However, it has not so far been possible to completely eliminate the negative tendencies in the changes of specific coal mining costs because deeper seams are being mined, excavation work is taking longer and other factors are increasing the costs.

Increasing the profitability of the Ukraine's coal industry is a complicated problem. If it is ever to be resolved, it will be necessary to involve all types of economic levers to stabilize the level of specific costs through making better use of all of the industry's resources and technology.

Pricing is one of these important levers and it should therefore be pointed out that efficient coal pricing can be achieved only if measures are also taken to improve the industry's management. Furthermore, it is not advisable to increase profits in the Ukrainian coal industry by raising the prices for Donbass coal because such a measure will always make it necessary to re-examine wholesale prices in other industries that use this coal. On the other hand, Donets coal may become too expensive for its buyers as opposed to coal from other basins or other fuels. Therefore, at the beginning of 1986, new account prices will be introduced and these will coincide with the wholesale prices for coal introduced at the start of 1982. The account prices should be used only for accounts with consumers who purchase coal through marketing organs. The second price list is to be applied to the accounts of coal-mining production associations with centralized coal-marketing organs. The essense of the price list for intra-industrial account coal prices (when subsidized) is that society compensates mines for their justifiable costs by pricing that

differs in its level from wholesale prices and has an organic sphere of action. Such prices as applied to the Donets Basin should be higher than existing wholesale prices by the amount of subsidies provided by the state to cover profit losses for coal mining and other losses set by the finance plan.

The most important difference between such intra-industry account coal prices and the earlier prices is that the price evaluation of production according to wholesale prices will be lower than it is according to account prices by the amount of state subsidies. Structurally, subsidized account prices for coal can be represented as the sum of the normal costs of coal production for the year in which these prices were introduced and the part of the standard subsidy necessary for financing planned costs not part of production costs.

As a structural part of account prices for coal, production costs in turn consist of two parts, one of which is recompensated by earnings from the realization of wholesale prices and the second by budget allotments. Subsidy-profit too should be strongly regulated and consist of the sums necessary to set up economic stimulation funds and for paying off credit interest and several other necessary planned expenses financed through profits.

The main reason subsidized account prices for coal were introduced was to provide production associations with the type of prices that would allow them to apply basic self-financing procedures, more precisely determine their own costs and reduce them, improve production quality and therefore acquire additional earnings to create their own resources for all forms of economic stimulation.

The introduction of subsidized account prices for coal is, in our opinion, the most acceptable form of price support for self-financing in the Ukrainian coal industry. It allows the application of economic levers for improving the use of available resources. Furthermore, these prices also allow for existing differences in individual coal mining costs and coal quality within the associations while preserving the existing wholesale prices for consumers.

12261
CSO: 1822/319

GENERAL

DATA ON LEVELS OF NATIONAL WELL-BEING, 1976-1990

Moscow VESTNIK STATISTIKI in Russian No 9, Sep 86 pp 54-58

[Unsigned article: "Improvement in the National Well-Being in the 12th Five-Year Plan"]

> [Text] The highest purpose of social production under socialism is the greatest possible satisfaction of the material and cultural needs of people.
>
> USSR Constitution, Art. 15

Today the task that is central to the work of communists and all working people is to carry out the basic policy set by the 27th CPSU Congress to accelerate the social and economic development of our country.

In recognition of the practical implementation of this policy, the fifth session of USSR Supreme Soviet, 11th convocation, examined and approved the plan for the 12th Five-Year Plan.

The plan calls for substantial gains for almost all indices relating to the tasks set by the Basic Directions, and in industry and certain important social areas in excess of the goals to some extent.

The tasks set forth in the plan assure in full measure realization of the main goal of the Five-Year Plan, the essence of which consists in increasing the rate and efficiency of economic development, attaining on this basis further improvement in the well-being of the Soviet people.

Fundamental and crucial under present conditions are scientific and technical progress, reconstruction, quality, and efficiency. This constitutes the foundation on which the Five-Year Plan rests.

Acceleration of the economic growth rate and improvement of social production efficiency make it possible to enlarge the production potential, while simultaneously addressing the ever larger circle of social problems and they expand material possibilities for implementing the party policy, to strengthen the social emphasis in economic development.

This is reflected primarily in the considerable increase in capital investments in the branch that are directly associated with growth of the national well-being. Strengthening of the material and technical base of the agro-industrial complex, production of consumer goods and paid services, and cultural and housing and public utilities construction are allotted almost 500 billion rubles, or half of all capital investments in the national economy. In this case it was possible to arrive at a successful and final solution to the so-called "residual" approach to planning in the social sphere.

There has been considerable growth in funding for improvement of working conditions and reduction in manual operations and work requiring heavy physical labor. In complete consonance with the tasks set by the Basic Directions, the number of workers involved in physical labor will be reduced by more than 5 million persons. This is an enormous savings of the most valuable resource of society, a most important factor of social activity improvement.

	Five-Year Increase, Percent		
	1976-1980	1981-1985	1986-1990, Based on Five-Year Plan
National income expended in consumption and savings	20.7	16.5	22.1
Industrial production	24	20	25
Manufacture of means of production (group "A")	26	20	24.3
Output of consumer goods (group "B")	21	21	27
Agricultural production (average annual amounts)	9	5.5	14.4
National labor productivity	17.4	16.3	23
Labor productivity:			
Industrial	17	17	25
Construction	11.0	13.7	21.0
Real per capita income	18	11	14
Retail goods turnover in state and cooperative trade exclusive of alcoholic beverage sales (in comparable prices)	22.7	21.7	33.4

The major feature of the plan is wide inclusion of virtually all strata of the populace in measures designed to increase income and resolve social problems. In the 12th Five-Year Plan it is planned to raise the salary and wages of 90

million blue-collar and white-collar workers compared to the 20 million figure for 1981-1985.

There are a number of provisions for raising the living standard for war and labor veterans and for augmenting the amount of assistance to families with children. These measures will be instrumental in improving the economic situation of more than 55 million pensioners and women with children.

Of primary importance in the plan is the development of non food consumer goods production. It is necessary to bring about substantial improvement in quality and selection of consumer items in addition to increasing the output of these goods.

The above goal was the motivation for revieving the tasks of the Integrated Program of Development of Consumer Goods and of the Service Sector.

The resulting increase is fairly large: Non food production for 1990 is set for a 16.3 billion ruble increase over the amount specified in the Integrated Program. This production in general in the Five-Year Plan will grow 35 percent instead of 30 percent.

The main topic being addressed is not basic necessities but satisfaction of demand for better-made, quality, fashionable goods.

Much remains to be done to raise output of everyday, personal, and domestic products in all branches of industry. There will be a 1.5-fold increase. Output for the five-year period will be 50 million television sets, 51 million radios, 31 million refrigerators, about 30 million washing machines, and large amounts of other domestic appliances. The quality problem of these goods is also very pressing.

Production of goods for the populace should become a truly nationwide matter, the subject of constant concern of party, soviet and economic organizations in every area and in every branch of industry.

The most important socio-economic task of the 12th Five-Year Plan is reliable provision of foodstuffs and agricultural products to the country.

A growth of 2.6 times is earmarked for agricultural production. The planned increase in the food industry exceeds that of agriculture. This will make it possible to meet in 1990 the per capita consumption of the more important food products set by the USSR Food Production Program.

Appreciable advances in the 12th Five-Year Plan will be made in livestock breeding, which is pivotal to improvement in the quantitative structure of food supply. The average annual increases planned are 2.8 million tons of meat and 9 million tons of milk.

In the 12th Five-Year Plan, wages and public consumption funds will show an increase.

In the 12th Five-Year Plan it is planned to implement the following measures for raising the national standard of living.

	1975	1980	1985	1990	
				Based on Five-Year Plan	Food Production Program
Per capita consumption of staple foods, kg:					
Meat and meat products	57	58	61	70	70
Milk and dairy products	316	314	323	330	330-340
Eggs, each	216	239	260	265	260-266
Vegetable oil	7.6	8.8	9.7	10.2	13.2
Vegetables and melon crops	89	97	102	127	126-135
Fruits and berries	39	38	46	68	66-70

Measures For Increase of Salaries and Wages

--Phased increase in wages and salaries of blue-collar and white-collar workers in production sectors of the national economy, in step with the creation of the necessary conditions and determination of available resources, chiefly by virtue of financing provided solely by associations, enterprises and organizations;

--completion of measures initiated in the 11th Five-Year Plan relative to salary increases for teachers and other education personnel;

--initiation of phased salary increases for personnel in health care, culture and higher schools;

--payment of a percentage differential in salaries and wages paid to blue-collar and white-collar workers for length of service in enterprises, institutions and organizations located in rayons of the Far East and Eastern Siberia;

--introduction of rayon increments to the pay of blue-collar and white-collar workers not presently receiving these amounts in the Urals, northern and eastern rayons of Kazakhstan and in northern rayons of Vologda and Kirov Oblasts;

--enhancement of material incentives for blue-collar and white-collar workers working the second and third shifts, primarily in machine construction; expansion of benefits and privileges for these workers, to be financed by the enterprises and organizations involved;

—elimination of tax liability on wages and salaries of up to 80 rubles per month, and reduction in tax liability on wages and salaries of 80 to 100 rubles per month.

Measures to Increase Payments and Benefits from Public Consumption Funds

—Implementation of step extensions, by rayon, in length of partially compensated leave of absence for working mothers for the purpose of child care, until the child attains the age of 1.5 years, with the added feature of additional unpaid leave until the child attains the age of two years;

—extension in length of pregnancy leave for working women from 56 to 70 calendar days and in paid leave for the purpose of caring for a sick child to 14 days;

—extension from 8 to 12 years of age of children in needy families receiving assistance;

—increase in amounts paid for meals in pre-school institutions; dispensing of cost free medication to children under three years of age;

Growth in Wages and
Public Consumption Funds

	1975	1980	1985	1990 Based on Five-Year Plan
Average monthly pay for blue collar and white collar workers, rubles	145.8	168.9	190.1	218
Wages paid to kolkhoz workers in the public sector of kolkhozes, rubles	92.0	118.5	153.4	180.4
Public consumption funds, rubles	90.1	117.0	147.0	183
Per capita amount, rubles	354	441	530	635

—elimination of small family tax liability for newly married couples for the first year following the day of marriage registration;

—increase in minimum amounts paid for age-related and disability pensions for former blue-collar and white-collar workers and pensions for loss of principal wage earner and in pensions for kolkhoz workers previously in effect;

—payment of pensions in the amount of 100 percent of established rates to pensioners who reside permanently in rural areas and are involved in

agriculture; implementation of measures for augmenting assistance to persons handicapped since childhood and improvement of their living standard;

--expansion in food and medication benefits for invalids of the Great Patriotic War confined to hospitals, to patients in maternity houses and central municipal and rayon hospitals, and increase in medication benefits for patients treated in dispensaries and polyclinics;

--increase in amounts paid to residents of nursing homes for the aged and handicapped for food, medication and other needs.

Growth in income will raise the purchasing power of Soviet people and lead to an increase, or more accurately, an escalation, in demands and requirements. In the 12th Five-Year Plan the policy will call for a reduction in sales of alcoholic beverages.

In general, retail goods turnover exclusive of alcoholic beverages will rise by more than a third, or by 92 billion rubles, in the five-year period. This increase in the past would require more than 10 years to be realized.

The 12th Five-Year Plan provides for an appreciable increase in paid services over manufacturing and sales of consumer goods. They will show a 1.5-fold expansion in the five-year period. This will be a substantial advance in organizing a modern, highly developed service system. At the same time, the task remains to develop an efficient system for servicing the populace on the part of enterprises of all ministries and departments, regardless of their primary responsibility.

In accordance with the aims of the 27th CPSU Congress, in the Five-Year Plan special importance is attached to improvement of living conditions and medical care, development of education and raising the standard of living.

The party has set forth a task of enormous social significance: providing virtually every family by the year 2000 with an individual apartment or home. Much work has been done to effect maximum exploration of possibilities of expanding residential housing construction in the 12th Five-Year Plan.

	New Housing, Millions of Sq. Meters of Useful area	Increase Over Previous Five-Year Plan, Millions of Sq. Meters
1976-1980	527.3	-17.5
1981-1985	552.2	24.9
1986-1990, based on five-year plan	595	42.8

Rural housing construction in the present five-year plan will develop at an accelerated rate. It will grow by 27 percent.

The five-year plan calls for considerable growth in availability of facilities intended for the well-being of the populace.

"The CPSU is committed to raising the well-being of the Soviet people to a qualitatively new height, assuring a level and structure of availability of material, social and cultural advantages which will be responsive to the maximum extent to the formation of a harmoniously developed ad culturally rich person and of conditions required for full development of the abilities and talents of the Soviet people in the interests of society." (Program of the Soviet Union Communist Party. New version)

	1976-1980	1981-1985	1986-1990, Based on Five-Year Plan
Increase in facilities financed by all sources			
Pre-school institutions millions of vacancies	2.9	2.9	4.4
Schools providing general education, millions of vacancies	6.7	5.2	7.2
Vocational and technical schools of USSR Gosprofobr, thousands of vacancies	631	467	810
Dispensaries and polyclinics, thousands of visits per shifts	651	710	908
Hospitals, thousands of beds	324	318	358

13005/9312
CSO: 1828/10

CARTOONS ILLUSTRATE MANAGEMENT CONCERNS

Moscow TRUD in Russian 18 Oct 86 p 4

[Cartoon by Yu. Prokopchuk]

They've started praising one another--this means there's soon to be a reduction in staff.

Moscow TRUD in Russian 4 Sep 86 p 4

[Cartoon by V. Bezborodov]

Move the table closer to the door. It's time to get closer to the people!

CSO: 1828/42

YAGODIN INTERVIEWED ON HIGHER EDUCATION CURRICULUM NEEDS

Moscow SOVETSKAYA ROSSIYA in Russian 24 Aug 86 p 2

[Interview with USSR Minister of Higher and Secondary Special Education G. A. Yagodin on the Problems of Training Specialists, by A. Chuba: "On the Threshold of Changes"]

[Text] [Question] Gennadiy Alekseyevich, throughout the country there is broad discussion of the CPSU Central Committee's draft concerning the restructuring of higher and secondary special education. Our editor's mail brings in a very large number of letters with advice and proposals, and some of those responses have been printed. Have the readers' proposals been heard, and are they being taken into consideration in the work of improving the instruction system in institutions of higher learning and technikums?

[Answer] How could it be otherwise? Of course they have been heard and of course they are being taken into consideration. I might recall that the CPSU Central Committee draft "Basic Directions in Restructuring Higher and Secondary Special Education in the Country" was published in early June of this year. The party submitted for nationwide discussion the comprehensive strategic program for resolving one of the urgent tasks in the development of society at the present-day stage. It is well known that the proficiency level and competency of cadres and their high civic responsibility largely determine the scope and rates of scientific-technical progress and the intensification of the national economy. When resolving the tasks assigned in that area, the higher and secondary special school system in the USSR achieved considerable success.

However, in recent years one has begun to notice undesirable tendencies in the training and use of specialists and specialist training has ceased to correspond properly to the tasks of accelerating the country's socioeconomic development. The material base at the institutions of higher learning has lagged seriously behind the needs of the day, and that was not only their fault, but also their misfortune.

The situation that had developed required changes. The persistent need for those changes was noted by the 27th CPSU Congress in its decisions, and it was soon after that congress that the party document concerning the restructuring of higher and secondary special education in our country appeared. More than

1.2 million persons took part in the discussion of the CPSU Central Committee's draft. More than 100,000 recommendations were submitted on ways to improve the training of students in the higher and secondary schools and to increase the scientific results obtained by the higher educational institutions. We also kept under close scrutiny the way in which those questions were being discussed in the press, particularly on the pages of SOVETSKAYA ROSSIYA... We put 12,000 of the most interesting proposals into the memory of the computers at the ministry's computer center. That invaluable treasure chest is constantly supplemented, and we hope to draw ideas from it for a long time. The work that we are beginning has been planned for the long-term period, until the year 2000 or later.

[Question] However, isn't it recommended that certain changes in the work of the institutions of higher learning be introduced within the near future?

[Answer] First of all we shall give the green light to recommendations that deal with problems that should have been resolved long ago, that were raised by life itself, and that have been tested in practice. What do I have in mind? First of all, improving the quality of specialist training.

In my opinion, the attraction toward the acquisition of knowledge is the distinguishing feature of every worker. A specialist who has stopped growing in his field of knowledge, who has stopped reading belles lettres, and who is no longer interested in what is going on around him, will not be able to meet the requirements that are being set today by life, or the task of accelerating scientific-technical progress. But in order to inculcate in a person the need to acquire knowledge, it is necessary to have a foundation. It is necessary first of all to accentuate the value of knowledge that is necessary for getting an education at an institution of higher learning, and that makes it possible to master the basic scientific trends and the basic scientific laws. The assimilation and use of those trends and laws must be aided by a well thought-out system of laboratory projects, exercises, seminar classes, and school-year projects. But you will agree that it is important not only to suggest to the student the road that he should take, but also to make sure that he overcomes large stretches of that road independently. The misfortune of the higher school system today consists in the fact that out of the 60 hours a week that the student spends on education, the share of independent work is no more than 20. This correlation is incorrect. The number of auditorium hours must be reduced. In the upper classes the auditorium load must be within the confines of 24 hours a week, and in the lower classes, no more than 28.

[Question] But what about lectures and seminar classes?

[Answer] One should not get the impression that their role is being reduced. In order to increase the return from the seminars, we recommend reducing the number of students in the group to 15. Of course this will not occur all at once. We do not yet have enough auditoriums for this and the financial situation is restraining us, but we have set that goal and we intend to reach it.

[Question] Gennadiy Alekseyevich, in almost every other letter devoted to the problem of restructuring the higher school system, the newspaper readers express their concern about the level of student readiness for practical work. And yet it is well known that certain institutions of higher learning in our country have accumulated experience in close interactions with enterprises, which experience makes it possible to graduate specialists who meet all the requirements of modern production. How is this experience being taken into consideration in the forthcoming restructuring?

[Answer] We feel that at most of the higher educational institutions a considerable part of the instruction should be transferred to the national economy. But it is absolutely necessary to keep in mind (and this is sometimes overlooked) the fact that the productive labor that is selected for combining with instruction must require the use of vocational knowledge. Then that knowledge becomes meaningful and the person begins to study in an intelligent manner and to realize why that is necessary. We want to achieve a situation when, in the practice of training of specialists, and primarily engineers, teachers, and doctors of medicine, that labor occupies a worthy place. In various institutes this will be organized differently, depending upon the conditions.

We shall see the extension of the practice when the institutes open up branches of the instructional departments at the enterprises themselves and the student will complete his training and get his diploma where he will be working. The number of such examples is not just one, and not just ten -- in the RSFSR more than 300 department branches are training specialists right on the job. One can only welcome this kind of cooperation. It is yielding outstanding results and nothing prevents other institutions of higher learning from following this example.

[Question] But you will agree that there is also a kind of "cooperation" that cannot be welcomed in any way. SOVETSKAYA ROSSIYA has frequently written about the practice of economic-contract projects when the institutions of higher learning execute, on the basis of work orders from enterprises, research that does not yield anything except a mythical standard effect, but nevertheless both the institutes and the coworkers who are listed as executors receive complete real monetary remuneration. How is it proposed to stop that practice?

[Answer] You are right. We know of many instances when enterprises act in the role of rich Maecenases, as patrons of science, who transfer to the account of the institutes, for practically no specific purpose, money which is supposed to be used to renew production or improve the working conditions... The fact that the institutes enjoy those little gifts, of course, is immoral. We are currently working on a statute which, after confirmation, will define clearly the customer's responsibility for the research topic and the executor's responsibility for the results of the project, and will rigidly stipulate matters pertaining to the awarding of bonuses, the payment of incentive awards, etc.

[Question] Many readers who took part in the discussion of the draft for the restructuring of the higher school system were in favor of authorizing the

institutions of higher learning to accept a larger number of students than normally authorized, so that subsequently they could weed out the unsuitable and unindustrious ones. Was that opinion heard?

[Answer] Yes, it was, but with a slight adjustment. Why accept more when it is possible to graduate fewer students?

[Question] But there exists a plan that defines the number of students that the institution of higher learning must graduate after the fifth year. Then, as is well known, the number of instructors depends upon the number of students...

[Answer] We are removing that dependence. Dismissal of students will not cause a reduction in the number teachers. In addition, the plan for graduating students is now formulated in the fourth year, when it is clear "who's who." In this regard certain requirements on the students are made more rigid. For example, the arbitrary transfer to the next year will be abolished. Practice has shown that this does not lead to any good: the work load in each subsequent year is greater, and the student, even if he does get rid of his "tail," immediately acquires a new one. A new rule will go into effect with the beginning of the new school year: if you haven't passed a failed examination by 1 September, it's goodbye! You won't be able to study with us!

[Question] How have the new rules for acceptance at institutions of higher learning worked out? Could you tell us about the results of the entrance examinations this year?

[Answer] The current acceptance at institutions of higher learning has become the first large-scale experiment in the spirit of restructuring. As is well known, instead of four examinations, the secondary-school graduates this year passed three, plus attending a vocational colloquium. Everyone was pleased with this -- the secondary-school graduates and also the teachers, who feel that the three examinations are completely adequate for determining how much knowledge the person taking the examinations has. The colloquium also met with the approval of the teachers. Many of them were given the opportunity for practically the first time to become acquainted with the student ahead of time, before he enrolled at the institution of higher learning. And that enabled them to look at him in a new way, to see the peculiarities that cannot be revealed by an examination.

And now a few figures. The total number of applications for the day school came to 1,224,000, which is 9 percent more than last year. This is an average of two persons per opening. The number of applications to technical and agricultural institutions of higher learning was 3.5 percent more than last year. And the number of applications to universities and pedagogical institutions of higher learning was 15 more -- this is the school reform beginning to operate. It is gratifying that there has also been a considerable increase -- 12 percent -- in the number of students entering the institutions of higher learning in the Nonchernozem Zone. Every fifth student

enrolled this year has had two years or more of production longevity; every tenth student has graduated with honors from a secondary educational institution. In a word, the institutions of higher learning have received good replacements, whom the forthcoming restructuring will help to become highly qualified specialists that are needed by the national economy.

5075
CSO: 1828/143

POPULATION FIGURES, TABLES GIVEN

Moscow EKONOMICHESKAYA GAZETA in Russian No 43, Oct 86 pp 6-7

[Report from the USSR Central Statistical Administration: "The Population of the USSR Reached 280 Million in Mid-1986"]

[Text] The editorial board of EKONOMICHESKAYA GAZETA received the following data on the population of our country from the USSR Central Statistical Administration.

During a quarter of a century, the population of the Soviet Union grew by 62.5 million people. During 1961-1965, its growth, on the average, amounted to 1.4 percent per year, during the years 1966-1970--to 1 percent; during the past 15 years the average annual growth rates of the population have remained at the level of 0.9 percent.

High growth rates are being registered by the population of the eastern regions of the country. During the years of the 11th Five-Year Plan, the numerical strength of the inhabitants of Eastern Siberia increased on the average by 1.3 percent per year, of the Far East and Western Siberia--by 1.7 percent. In Tyumen Oblast, where there was extensive development of gas and oil deposits, the average annual growth rate of the population came to 5.7 percent.

Table 1. Numerical Strength of the Population of the USSR

	Численность на начало года, млн. человек (1)			В % к общей численности населения (2)	
	все население (3)	городское население (4)	сельское население (5)	городское население (4)	сельское население (5)
1961	216,3	107,9	108,4	49,9	50,1
1966	232,2	123,7	108,5	53,3	46,7
1971	243,9	138,8	105,1	56,9	43,1
1976	255,6	155,1	100,5	60,7	39,3
1981	266,6	168,9	97,7	63,4	36,6
1986	278,8	182,9	95,9	65,6	34,4

Key:
1. Number at the Beginning of the Year, in Millions
2. In Percent of Total Population
3. Total Population
4. Urban Population
5. Rural Population

Of the total population of the country, 72 percent live in the European and 28 percent--in the Asiatic part of the USSR.

In terms of the number of inhabitants, the Soviet Union occupies third place in the world after China (in 1986--1.0464 billion people) and India (in 1985--750.9 million people).

Table 2. Change in the Number of Urban Settlements and the Number of the Urban Population

	(1) Число городских поселений			(2) Численность городского населения, млн. человек		
	(5) всего	(3) в том числе		(5) всего	(4) в том числе проживающего в:	
		(6) городах	(7) поселках городского типа		(6) городах	(7) поселках городского типа
1959	4619	1679	2940	100,0	83,0	17,0
1970	5505	1935	3570	136,0	116,3	19,7
1979	5914	2062	3852	163,6	141,9	21,7
1986	6131	2170	3961	182,9	159,5	23,4

Key:

1. Number of Urban Settlements
2. Number of Urban Population, in Millions of People
3. Including
4. Including Living in
5. Total
6. Cities
7. Urban-Type Settlements

Of the total number of the urban population, 87 percent are inhabitants of cities and 13 percent--inhabitants of urban-type settlements. More than 39 million city-dwellers (21 percent) live in cities with a population of more than a million people. At the present time, there are 22 cities with populations of a million or more, whereas the census of 1959 identified only three cities of that size--Moscow, Leningrad, and Kiev. During the 1960's, Baku, Gorkiy, Kuybyshev, Novsibirsk, Sverdlovsk, Tashkent, and Kharkov became cities with populations of more than a million. After 1970, they were joined by another 12 cities--Minsk, Dnepropetrovsk, Tbilisi, Odessa, Chelyabinsk, Donetsk, Yerevan, Omsk, Kazan, Perm, Ufa, and Alma-Ata. During the next few years, the appearance of the millionth citizen is expected in Rostov-na-Donu and Volgograd.

During the past 15 years alone, 232 new cities have come into being, among them Nadym, Nizhnevartovsk, Labytnangi, Neryungri, Tynda, Strezhevoy, Novyy Urengoy, and Kostomuksha. Rapid growth has been registered by a number of industrial cities. Thus, between 1971 and 1985, the population of Tolyatti increased from 287,000 to 610,000 (by a factor of 2.1), Nizhnekamska--from 56,000 to 177,000 (by a factor of 3.2), Surguta--from 39,000 to 215,000 (by a factor of 5.5), Brezhneva--from 55,000 to 459,000 (by a factor of 8.4), and Nizhnevartovska--from 21,000 to 200,000 people (by a factor of 9.7).

During the years 1983-1985, an increase in the birth rate was noted in the country. Approximately the same level in the birth rate was maintained also in

1986. The growth in the birth rate of the USSR has been called forth to a significant degree by measures to strengthen state assistance to families with children.

The increase of the overal indicator of mortality during the years 1970-1985 is, to a certain extent, related to "the aging" of the population--the increase in the share of persons of elderly age in the total population.

As of June 1985, a reduction in mortality is observed in the country, the most significant reduction--from accidents, poisoning, and injuries (by 24 percent in comparison to the preceding period). There was a substantial reduction in the number of deaths (by approximately 100,000 people) from disorders of the blood circulation system, mainly due to measures to fight hard drinking and alcoholism.

Table 3. Birth Rate, Mortality, and Natural Growth of the Population in the USSR

	1970	1980	1983	1984	1985
(1) Тысяч человек					
(2) Родившиеся	4226	4851	5392	5387	5374
(3) Умершие	1996	2744	2823	2965	2947
(4) Естественный прирост	2230	2107	2569	2422	2427
(5) Умершие дети в возрасте до 1 года	103	132	134	140	140
(7) На 1000 жителей					
(2) Родившиеся	17,4	18,3	19,8	19,6	19,4
(3) Умершие	8,2	10,3	10,4	10,8	10,6
(4) Естественный прирост	9,2	8,0	9,4	8,8	8,8
(6) Умершие дети в возрасте до 1 года (на 1000 родившихся)	24,7	27,3	25,3	25,9	26,0

Key:

1. Thousands of People
2. Born
3. Died
4. Natural growth
5. Deceased infants aged 1 year or under
6. Deceased infants aged 1 year or under (per 1,000 born)
7. Per 1,000 Inhabitants

8970
CSO: 1828/17

PREPARATIONS FOR UPCOMING ALL-UNION TRIAL CENSUS DETAILED

Moscow VESTNIK STATISTIKI in Russian No 10, Oct 86 pp 28-34

[Article by T. Labutova, deputy chief of the Population Census and Survey Administration: "Trial Census of the Population"]

[Text] In connection with the preparation for the All-Union Population Census in 1989, a trial census will be conducted in December of the current year. Its goal is to verify the drafts of the methodological and organizational regulations of the All-Union Population Census in 1989, to test the technological process for processing the census materials with the use of optical reading devices of new design, and to train persons responsible for the preparation of the basic census of the population in the republics, krays, and oblasts.

The trial census of 1986 will begin on 10 December at 8 am local time and will continue both in urban settlements and in rural localities for 8 days (to 17 December inclusive). The population count will be carried out as of 12 p.m. of the night from 9 to 10 December (from Tuesday to Wednesday). Ten regions, with a total population of approximately 800,000 people were selected for the census; of them, about 60 percent are urban inhabitants and 40 percent rural inhabitants. In the RSFSR--Pravoberezhnyy Rayon of the Severo-Osetinskaya ASSR, Istrinskiy Rayon of Moscow Oblast, Iskitimskiy Rayon of Novosibirsk Oblast, Industrialnyy Rayon of the city of Perm; in the Ukrainian SSR--Marinskiy Rayon of Donetsk Oblast; in the Belorussian SSR--Moldechnenskiy Rayon of Minsk Oblast; in the Kazakh SSR--Tyulkubasskiy Rayon of Chimkent Oblast; in the Azerbaijan SSR--the city of Mingechaur; in the Latvian SSR--Valmiyerskiy Rayon; in the Kirghiz SSR--part of the Kara-Suyskiy Rayon of Osh Oblast.

The program of the trial census includes the following questions, which, in the case of acceptability, may be adopted for the All-Union Population Census in 1989:

1. Relationship to the family member registered first (family member registered first; wife; husband; daughter; son; mother; father; sister, brother; mother-in-law, father-in-law (on husband's side), mother-in-law, father-in-law (on wife's side); fiancee (daughter-in-law), son-in-law; grandmother, grandfather; granddaughter, grandson; nephew, niece, and others; living alone; family member living separately).

2. Sex (male, female).

3. For the person living here permanently, but temporarily absent, write:
   a. Reason for absence
   b. Time of absence.

4. For the person living here temporarily, write:
   a. Address of place of permanent residence
   b. Time of absence in place of permanent residence.

5. Date of birth, number of years old

6. Marital status (married; never married; widower, widow; divorced; separated).

7. Nationality.
   For foreigners also indicate citizenship.

8. Native language.
   Indicate also any other language of the peoples of the USSR freely spoken

9. Education (higher, incomplete higher, secondary specialized, general secondary, incomplete secondary, elementary, no elementary).

10. Whether completed vocational-technical educational institution (yes, no).

11. Type of educational institution in which studying (VUZ; secondary specialized educational institution; general education school; secondary vocational-technical school; other school, courses; not studying).

12. Sources of livelihood (work in enterprise, institution; work in kolkhoz; work on own farm (for individual peasants and handicraftsmen) or with private citizens; private subsidiary farm; pension, allowance; stipend; other type of state security; maintenance; other source).

13. Place of work (complete name of enterprise, institution, kolkhoz or own farm).

14. Occupation at this place of work (position or work performed).

15. Social group (worker, employee, kolkhoz worker, handicraftsman, individual peasant, minister of religion).

16. Has been living continuously in this settlement since birth or not (yes, no).
If "no", indicate:
   a. Year when continuous residence began
   b. came from what settlement (from urban, from rural).

17. For women, indicate:
   a. How many children born
   b. How many of them living.

Characterization of building and housing accommodations:

18. Period of construction of building (before 1917, 1917-1940, 1941-1945, 1946-1950, 1951-1970, 1971-1980, 1981-1986).

19. Material of external walls of buildings (brick, stone, concrete, reinforced concrete, block, panel; wood; straw brick, clay; other material).

20. Building (house) belongs to (socialized housing resources, housing-construction cooperative, is in private ownership of citizens).

21. Type of housing premise (separate house, separate apartment, common apartment, dormitory, other housing premise, rents housing premise from private citizens).

22. Amenities of housing premises (electricity, central heating, water supply, sewer system, hot water supply, standard gas or electric stove, bathtub or shower, none of the indicated amenities).

23. Number of habitable rooms being occupied.

24. Total area (usable) and living area (square meters).

This program was discussed in sessions of the collegium, the permanent Census Commission, and the Scientific-Methodological Council of the USSR Central Statistical Administration. Its draft was also circulated to the central statistical administrations of the union republics and the statistical administrations of the ASSR's, krays, and oblasts. In the course of the discussion, the experience of the conduct of population censuses and surveys in our country and abroad was taken into account and the recommendations of the Permanent Commission of CEMA in regard to cooperation in the sphere of statistics and the Statistical Commission of the United Nations were utilized.

In terms of the majority of the questions of the program, continuity with past censuses was preserved with a view to studying the dynamics of the population. Along with this, there are also substantial changes: Included were seven new questions that characterize the housing conditions of families and persons living alone. The importance of studying this subject is obvious. In the new edition of the Program of the Communist Party of the Soviet Union, adopted at the 27th CPSU Congress, it is indicated that "the party regards as a matter of special social significance the acceleration of the solution of the housing problem, in order that by the year 2000 practically every Soviet family would have separate housing--an apartment or an individual house." The results of the census will help determine the regions and social groups which should be given immediate attention in the solution of the housing problem. Further, in connection with the broad development of vocational-technical training of young workers, a new question has also been included: "Whether completed vocational-technical educational institution." In order to study the questions of the birth rate better, in addition to the total number of children born, it is also indicated how many of them are alive at the moment of the census. To elucidate the directions of the migration flows, the subquestion "came from what settle- ment (urban or rural)" was added.

Some questions of the program for the trial census were formulated differently in comparison with the past censuses. The traditional formulation of the 1st

question of the census questionnaire "Relationship to head of family" was replaced by "Relationship to the family member registered first" since, in the conditions of the complete equality of spouses, the concept of "head of family" has basically lost its primary significance. In the course of the questioning, the spouses, especially the young ones, have difficulty in determining who of them is the head of the family. The new formulation has already been tested in the election survey of the population in 1985 and has proved to be acceptable.

The question about age has also been formulated differently. Instead of the period of birth "born prior to 17 January or 17 January and later" (as this was in the census of 1979), the date of birth--day, month and year--will be recorded. In addition, in one of the variants of the census questionnaires, the formulation "month and year of birth" will be tested and simultaneously the entry about the number of years old.

In order to obtain more complete information about the sources of livelihood of people who do not have one source (for example, pensioners who work or those employed in a kolkhoz and in private subsidiary farming, etc.), two sources of means of livelihood will be registered. In past censuses, only one (basic) source was registered in any case.

The census of 1989 (as also the censuses of 1970 and 1979) is planned to be conducted with the use of the selective method. For this reason, in the trial census, answers to questions 1 through 12 of the program will be obtained from the entire population, but answers to questions 13 to 17--from 25 percent of the permanent population. Answers to questions 18-24 about the characterization of housing conditions will be obtained from every family, every person living alone, and every family member living separately. In connection with this, two forms of the census questionnaire are being used: A census questionnaire for a complete census, including questions 1-12 and 18-24, and a census questionnaire for a selective census, including all 24 questions. The census questionnaire for the selective census will be filled out in every fourth housing premise (a 25-percent sample), in the remaining premises the census questionnaires for the complete census will be filled out.

For the selection of housing premises, the data of the notebooks of the counters will be used. On the eve of the census the counter will make the rounds of all premises in his sector and record in their notebook on a separate line every premise in which the population lives (one-apartment house, apartment, room in a dormitory, etc.). After the preliminary round, on the last day before the census, the instructor-inspector, in the notebook of the counter, will note every fourth premise with permanently-residing population.

The above-indicated program will be applied in four rayons of the trial census (Iskitimskiy, Industrialnyy, Marinskiy, and Tyulkubasskiy) and in the city of Mingechaur. In these rayons, two persons may be registered in the census questionnaire for the complete census, in the other five rayons (Pravoberezhnyy, Istrinskiy, Molodechnenskiy, Valmieyerskiy, and Kara-Suyskiy)--three persons, since the questions about the housing conditions of families and persons living alone in these rayons enter into the program of the selective census, moreover not all seven questions, but only four (type and amenities of housing premise, number of rooms, and size of living space). Thus, in the trial census, two

variants of the census questionnaires for the complete census (forms 2S1 and 2S2) and two variants of the census questionnaires for the selective census (forms 3V1 and 3V2) will be used. The census questionnaire for the selective census in both variants is filled in for one person. The use of the two variants is envisaged in order to determine the expenditure of time and means for the conduct of the census and the elaboration of its materials for two different programs, which differ from one another mainly by the number of questions about housing conditions and by the method for the collection of information about them (complete or selective).

As is well-known, in the 1979 Census a fundamentally new census questionnaire was used, which served simultaneously also as the technical carrier of the primary information for its input into electronic computers. In connection with this, the method for filling in the census questionnaires and the procedure for their processing were changed. In the 1989 Census, it is planned to use such a form of the census questionnaire in which the answers to the majority of questions will be filled in by the counter with graphic marks or standardized numbers. These marks and numbers are codes for corresponding information, which will be entered on magnetic tape with the aid of special reading devices for the subsequent processing of the census materials on the basis of an established program. For a number of questions, such as nationality, language, place of work, occupation, the answers, because of their great diversity, will be noted down in words by the counter. Then, in the statistical administration, these notes will also be coded with the aid of dictionaries (manuals for coding).

In the 1979 Census, the optical reading devices interpreted only graphic marks. The automatic machine, improved for the coming census, which reads numerical signs as well, will make it possible to increase the capacity and informativeness of the census questionnaire and speed up the calculation of the census results. It is planned to enter the information on magnetic tape from the census questionnaires of the trial census in two such machines; for the processing of the materials of the basic census it is proposed to equip the majority of the statistical administrations with automatic reading machines. Moreover, they will be put in a set with personal computers.

In connection with the fact that the census questionnaire serves simultaneously also as the technical carrier of primary information, being entered into the computer, increased technical demands are made with respect to the quality of how it is filled in. All notes, graphic marks and numerical signes must be made only with a simple black lead pencil of the trademark "M". To fill in the census questionnaire with a pencil of a different trademark or a ball-point is not permitted. It is also required that the graphic marks be filled in very accurately, that they be shaded in completely. For this reason, the census questionnaires need to be filled in on a hard and smooth surface, for which every counter will have a specially manufactured plate the size of the census questionnaire. The graphic marks and numerals must not go beyond the limits of the contour of the rectangle, in which they are entered. It is also necessary to secure the preservation of the physical state of the census questionnaires: To protect them against pressure, spots, bends, and breaking, since a crushed census questionnaire will not be fit for insertion into a reading machine, and the presence of spots may cause the incorrect perception of the initial data by

the machine. In connection with the increased demands for the preservation of the census questionnaires, they will be kept (as also in the 1979 Census) in special briefcases.

In the trial census, a special form 1--a list of those living in the premise--will be filled in. It is composed for every apartment, separate house (if there is one apartment in it) and other one-apartment structure, and in a dormitory--for every separate room. The list is introduced in connection with the limited nature of the format of the census questionnaire and the absence, in it, of a place for placing an address part and complete formulation of the questions about the categories of the population. Consequently, the necessity of compiling the list is called forth mainly by technical reasons. At the same time, it has proved to be extremely useful, being conducive to the completeness and accuracy of the registration of the population. In the course of the census, the counter enters into the list by name all the persons subject to the census in a given premise. In so doing, the entries are made by family. Every person entered into the list must also be registered in the census questionnaire. All census questionnaires filled in for the corresponding premise, following the designated procedure, are inserted in the "List", which thus helps to protect them in the premises during the census.

The trial census is regarded as a kind of rehearsal before the basic census; in it are performed all the types of work which will be carried out in the preparation and conduct of the All-Union Population Census of 1989. In particular, the territory of the rayons and cities, where the trial census is conducted, is divided into census departments, instructor and counter sectors, proceeding from the norm of the work load of the census personnel established for each rayon. In connection with the expansion of the program, the work load has been decreased somewhat by comparison with the 1979 Census. A counter in urban settlements will register, on the average, 600 people (and not 630), in the rural locality--500 people (and not 530). Proceeding from the indicated average workload norms for the counter, in an instructor sector four to five counter sectors on the average will be included in urban settlements, in the rural locality--four, and in the census department correspondingly eight and six instructor sectors.

The territory of a rayon or city is divided into census sectors on the basis of the lists of houses and rural localities, as well as the existing cartographical material (plans and maps). The work in regard to the composition of the indicated lists and cartographic material in the rayons and cities of the trial census has already been completed. It was preceded by a number of other preparatory work operations that are conducted by the organs of state statistics. In order not to permit the underregistration of the population in the census, the boundaries of urban settlements were more precisely defined in every rayon, the names of the streetsand the numbering of the houses and apartments in them were put in good order; and the completeness and accuracy of the current registration of the population in the cities and villages were verified.

As is well known, the success of a census depends in many respects on the timely selection and quality of training of census personnel. These cadres are selected by the chiefs of the rayon (city) computing and data processing stations (centers) and the inspectors of state statistics, then the census workers are

personally approved by the ispolkoms of the rayon (city) Soviets of People's Deputies. This work must be completed before 31 October 1986. Workers of enterprises, institutions and organizations are enlisted as counters for the trial census. To obtain practical skills, the chiefs of the population census and survey departments of the central statisticial administrations of the union republics, the statistical administrations of the ASSR's, krays, oblasts, and cities during the period of the census will work basically as instructors and controllers.

The training of workers for the conduct of the census goes through several stages. During July and August 1986, there was instruction for the chiefs of the population census and survey departments of the central statistical administrations of all the union republics and the statistical administrations conducting the trial census (including the chiefs of the rayon (city) computing and data processing stations (centers) and the inspectors of state statistics). The directors of these rayon organs, in their turn, in October and November will teach the census cadres the procedure for conducting the trial census of the population. On the eve of the trial census of the population, the rayon (city) computing and data processing stations (centers) and the inspectors of state statistics will verify the preparedness for it and will distribute the documents to the direct executors.

Mass explanatory work among the population about the goals and tasks of the trial population census and the procedure and time periods of its execution should be actively conducted. For this, all means of information must be used: The local press, radio, television, and the organization of reports and discussions in enterprises, in cultural and educational institutions, and at the place of residence of citizens.

During the period of the conduct of the census (from 10 to 17 December), the counters will fill in the census questionnaires by means of a survey of the population at the place of residence, even if only temporary, and without request present documents confirming the correctness of the answer. During the trial census (as also during preceding censuses), the present population will be registered with the singling out of those temporarily residing and the permanent population with the singling out of those temporarily absent. The registration in the census questionnaires will be effected regardless of the presence of the registration of citizens and its character (permanent or temporary) and the right to living space in this or that place.

The most important task of every census is the completeness and accuracy of the count of the population, which is attained through the use of a number of control measures. In the trial census of 1986, the same control measures will be used as in the past censuses (a control form, information about undergoing the census, control rounds).

Through the control forms, the completeness of the count of the population on hand, above all, is verified. They are composed by the counters during the census and by the instructors and controllers during the control round for the verification of the undergoing of the census by the persons with respect to whom there is doubt that they went through the census at the place where they were on the date of the census. For this, the detailed address of the place,

where a given person was on the date of the census, is entered on the control form, along with the questions of the census questionnaire. After the census, it is verified for this address whether this person is registered in the census questionnaire; if he is not registered, the information about him is transferred from the control form to the census questionnaire.

In order to avoid double counting of the population on hand, a certificate about undergoing the census is used. It is issued to all those registered as temporarily residing, as well as to persons for whom control forms have been compiled, and those who propose to leave for another place, even if only for 1 day, during the census or the control round. The issue of certificates to these people significantly reduces the work in regard to the compilation of the control forms. Those who have a certificate about having undergone the census do not have to be registered a second time in the census questionnaires outside the place of their permanent residence.

After the termination of the census, control rounds will be made in the course of three days (from 19 to 21 December inclusive).

The control round is conducted by the instructor-inspector jointly with the counter. In order to save labor expenditures and funds, the control rounds, as also during the 1970 and 1979 censuses, will be selective. In the urban settlements, where the building is more compact and the territories of the census sectors are not very large, the control round is conducted in all counting sectors and in each one of them 25 percent of the housing premises will be verified. In the village, in connection with the fact that the territories of the census sectors, as a rule, are larger, the control round is conducted in 25 percent of the counting sectors, in which all housing premises will be verified.

During the control round, the instructor-inspector verifies whether all families and persons living alone (including those who have arrived after 9 December) have undergone the census. All those who are subject to the census in a given premise, but were omitted by the counter, he enters into the list and the census questionnaire.

After the conduct of the census, the control round and the verification of the census material in the rayon, it is received in the appropriate statistical administrations or in the central statistical administration of a union republic without oblast division for preparation for automatic processing. Preparation consists in the completing of the census questionnaires for the urban settlements and the rural localities, the codification of the questions of the census questionnaire, the answers to which the counters registered in words, and not in graphic marks or numerical signs, in the control of codification and the correctness of the filling in of answers to all questions of the census questionnaire.

After this, the census questionnaires of Valmierskiy Rayon of the Latvian SSR and the Molodechnenskiy Rayon of Minsk Oblast are received in the Computing Center of the Statistical Administration of Minsk Oblast, and the census questionnaires of the other rayons of the trial census--in the Main Computing Center of the USSR Central Statistical Administration. In the Computing Center of

the Statistical Administration of Minsk Oblast, the information from the questionnaires of the indicated two rayons will be entered on magnetic carriers, which they will then send to the Main Computing Center of the USSR Central Statistical Administration, where, in accordance with the planned program, the results of the trial census for all of its regions will be calculated in a centralized manner. This work must be completed before May 1987.

Along with the complete results obtained at the Main Computing Center of the USSR Central Statistical Administration, short results will also be calculated. In so doing, in four rayons (Industrialnyy, Iskitimskiy, Marinskiy, and Tyulkubasskiy) and in the city of Mingechaur, short results will be obtained (as also in past censuses) on the basis of summary lists which are filled in by the census personnel and the chiefs of the rayon (city) computing and data processing stations (centers) and the inspectors of state statistics manually. In four rayons (Istrinskiy, Molodechnenskiy, Valmiyerskiy, and Kara-Suyskiy), an automated calculation of short results based on the census questionnaires will be tested with the aid of the new machine-read document "Accompanying Form", which is compiled for every locality. The same requirements in regard to the filling in of this document are made as in regard to the census questionnaire. In order to assess the advantages and shortcomings of both methods of obtaining short results, in some counting sectors of Pravoberezhnyy Rayon summary results will be compiled, and in others--accompanying forms.

In connection with the different variants of the calculation of short results, two variants of notebooks for the counter and the instructor-inspector will be used.

With a view to the generalization of the experience of the work with respect to the trial population census, the central statistical administrations of the union republics and the statistical administrations are obligated to compile detailed reports, in which suggestions and observations in regard to the program should find reflection (especially as regards the newly included questions), on the workload norms for the census personnel and as regards other questions related to the preparation, conduct, and processing of materials of the trial population census.

8970
CSO: 1828/17

IL-76 OPERATIONS EXPAND IN YAKUTSK AREA

Moscow VOZDUSHNYY TRANSPORT in Russian 7 Oct 86 p 1

[Article by Ye. Lykhin, VOZDUSHNYY TRANSPORT part-time correspondent in Yakutsk: "New Items From the Branch"]

[Text] Fruit occupied the most honored spot on the shelves of Yakutsk's stores at the end of the summer and the beginning of fall. The Il-76TD, which was recently placed at the disposal of the Yakutsk Administration of Civil Aviation, delivered dozens of tons of gifts from the sunny south to the capital of the northern republic

They had waited here for this machine with impatience and had carefully prepared to receive it. A place for parking and servicing the aircraft had been set up; and the Yakutsk pilots, engineers and technicians had undergone training with their Magadan, Krasnoyarsk and Irkutsk colleagues who had experience in operating the Il-76 cargo airplane. The winged hero was transferred to the hands of a crew commanded by V. Kuzmin, deputy commander of the Yakutsk Aviation Enterprise, at the Tashkent Aviation Plant. V. Shmakov, an instructor pilot from the Krasnoyarsk Administration of Civil Aviation, participated in the run of the new machine. The efforts of many people were required so that another address -- Yakutiya -- would appear in the biography of the Il.

A gala meeting awaited the Il-76 at the end of its long journey from Central Asia. Its arrival was a notable event in the life of a republic where a special role belongs to air transport. The large distances and the poorly developed network of surface roads to a great extent condition the important tasks which aviation is fulfilling here.

A. Manturov, the chief of the department for organizing freight shipments, had said: "It is clear today that -- only having available a pool of An-26 and An-12 -- we will not be able to keep pace with the increase in the requirements of the national economy for aviation services. Yakutiya needs airplanes capable of taking large-size freight on board. Here is a graphic example.

In order to deliver a heavy bulldozer to miners using the An-12 airplane, it is necessary to remove the cabin and suspended equipment from it. Otherwise, it will not fit here. The bulldozer can be accommodated in the Il-76 as a complete unit."

The republic now has two airports capable of receiving the Il-76 year round--in Yakutsk and the Polyarniy settlement in Mirninskiy Rayon. During the winter, it will also be able to land at Tenkeli--one of the main destination points in the air cargo shipment plan operating in Yakutiya.

The Chulman airport, which is located not far from Berkakit--the final station on Malyy BAM [Baykal-Amur Mainline], will be set up this winter to receive the Il-76. That is when the new airplane will indeed prove itself: not 4-5 tons and not 10-15 tons, as now, but up to 50 tons of freight will be ferried across the Chulman-Yakutsk-Tenkeli air bridge in one trip. This is already a new step in organizing shipments on local routes.

8802
CSO: 1829/11

CIVIL AVIATION R&D COORDINATION, ADMINISTRATIVE PROBLEMS

Moscow VOZDUSHNYY TRANSPORT in Russian 18 Oct 86 p2

[Article by S. Skripnichenko, candidate of technical sciences and sector chief in the State Civil Aviation Scientific Research Institute: "Without Wind in the Sails"]

> [Text] Several months ago, the rubrik "The Key Factors in the Effectiveness of Branch Science"was begun on the pages of our newspaper. The editors planned to publish a series of articles by the directors of scientific research collectives, scientists, engineers, and designers under the new rubric. V. Ivanov, the chief of the Aeroproyekt Civil Aviation Design Institute and Scientific Research Institute, was the first to appear with a frank discussion of the acute problems that are arising on the path of the institute's scientists ("In a Design -- the Latest Achievements", VOZDUSHNYY TRANSPORT, No 48 dated 22 April 86). Extremely important questions concerning the development of science in civil aviation were also raised in the article by V. Smykov, deputy chief of the State Civil Aviation Scientific Research Institute, entitled "Key Points of Support"(VOZDUSHNYY TRANSPORT, No 107 dated 6 September 1986).
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> The editors would like that the first and second -- and all subsequent -- articles remain at the center of attention of the specialists in our ministry so that the newspaper material will help not only to reveal shortcomings, which are applying the brakes to scientific and technical progress, but also to eliminate them. In the article that is being published below, we are continuing the important discussion of the fundamental problems in branch science.

As is known, a fundamental task has been assigned during the current five-year plan -- to strengthen the connection between science and production and build those organizational forms for integrating science, technology and practice which will permit the accurate and rapid passage of ideas from origination to widespread application in practice to be assured. A great deal

of attention is being devoted to expanding the network of scientific production association and to strengthening the "factory sector of science".

Our solution of these tasks is being delayed and, moreover, opposing tendencies are being directly contemplated in a number of cases. For example, it seems clear that it is only possible to engage in repair subjects and to insure the effective incorporation of works only in factory scientific laboratories or in scientific production associations.

Incidentally, both our union-wide and world experience testify to this. However, as is not surprising, we are strengthening this avenue along the traditional path -- a special section for researching the repair process is being created within the structure of the leading institute. Naturally, the danger exists that this subject will remain separate from production as before.

The absence of direct organizational links between science and practice is also typical for other operating avenues that are connected with maintenance. For example, both in our institute and in the Aeroproyekt State Design Institute and Scientific Research for Civil Aviation, subunits exist which are studying questions concerning the development and operation of ground equipment for airports. The proposal to combine them with the operating subunit and to create a scientific production association has been ripening for several years in the ministry -- or some other form of cooperation between science and the operators. As they say, however, that is neither here not there.

In our institute, today, preparations for converting to a cost accounting relationship are being conducted. Cost accounting must thereby bcome a powerful leader for the acceleration that our branch science so lacks. A certain uneasiness, however, is now arising: Will all of this only come to the filling out of a still larger number of report documents and will the new system completely satisfy the principle of the wage fund accurately, depending on the enterprise's profits-- the income of each one on his actual contribution? And turn out so that the very idea of cost accounting, without providing directors at all levels the freedom to maneuver labor and financial resources, is discredited and will provide only a negative effect instead of a positive one? It seems that questions concerning the transfer to cost accounting must be carefully regulated and discussed in the Scientific Technical Council of the Ministry of Civil Aviation.

In my view, one of the key factors in raising the effectiveness of branch science lies in increasing the role of the leading institute which has been called upon to coordinate all research work in the branch. The State Civil Aviation Scientific Research Institute, however, operates as a normal scientific research institute.

The actual subordination of scientific organizations to different ministry administrations also contributesto this. Requests for the carrying out of scientific research work arrive in the branch institutes from the administrations and they perform work on many subjects, but research on the optimum avenues and on the rational distribution of financing and resources -- unfortunately -- is not conducted. As a result, there is a lack of coordination in

subject matter, a small number of integrated works at the junction of several avenues, and even the direct duplication of tasks. Of course, such a state of affairs demands very rapid correction. But how? Perhaps it is necessary to return to the idea of establishing a scientific research center for the branch with a single director?

It is certainly possible to create a center, but it will not solve all problems if a powerful subunit for researching the effectiveness of branch scientific work is not formed in the leading institute. It would determine the main avenue of research and its importance. Its specialists would substantiate the long-range and current plans of the State Civil Aviation Scientific Research Institute and would engage in the distribution of financial and labor resources.

It is impossible not to pay attention to the development of the laboratory base; you see, one cannot perform research only on paper. A number of departments still do not have their own laboratories. Thus, laboratory testing grounds for researching the operating properties of ground equipment are absent, and there are not enough stands for processing the requirements for control and stability systems on future aircraft. What kind of acceleration can we talk about in this case?! The establishment of scientific production associations, well thought-out steps to incorporate the costaccounting system, increasing the role of the leading civil aviation institute, equipping it and other scientific research institutes with the necessary laboratory base — here are some of the main key factors in the effectiveness of branch science. As soon as they begin to operate, the words "acceleration" and "restructuring" will acquire a true ring.

8802
CSO: 1829/11

CHIEF ON Yak-42, AIR OPERATIONS IN LITHUANIA

Vilnius SOVETSKAYA LITVA in Russian 24 Oct 86 p 2

[Interview with G. G. Lyakhov, chief of the Lithuanian Administration of Civil Aviation and USSR honored pilot; date and place not specified]

[Text] As has already been reported, the Lithuanian Administration of Civil Aviation has begun to operate the new Yak-42 passenger airplane.

Regular flights of this airplane on the Vilnius-Moscow (Sheremetyevo Airport) air route began on 20 October.

What new conveniences appeared for air passengers, what are the main distinctive features in the operating of the Yak-42 airplane, and what problems arise in connection with this? G. G. Lyakhov, chief of the Lithuanian Administration of Civil Aviation and USSR honored pilot, replies to these and other question from our correspondent.

[Question] Gennadiy Georgiyevich, first, permit me to congratulate you and the entire collective of the Lithuanian Administration on this outstanding event in the administration's history. Our readers already know that this airplane differs substantially from those operating previously. Could you cover in more detail the main distinctive characteristics of this aircraft? How was training in its operation carried out?

[Answer] Thank you for your congratulations. It was actually a very stirring event for us. In our turn, we are grateful to the Ministry of Civil Aviation and understand the serious responsibility that has been placed on us.

Besides those purely technical distinctive features about which your readers already know, I would like to dwell on its qualitative indicators. First of all, the airplane possesses high fuel efficiency. The specific expenditure of kerosene per one passenger kilometer is 20 percent lower than in Tu-134 airplanes. The operation of the Yak-42 combined with other measures to save fuel and energy resources will permit passenger turnover to be increased 17.4 percent during the five-year plan without increasing allocations of aviation fuel.

Another distinctive feature is the container shipment of payloads. This permits loading and unloading operations to be mechanized.

There are other substantial and even fundamental differences in the airplane's equipment and its systems. A flight is made using three crew members. This has become possible thanks to the use of the latest navigational systems based on electronic computer technology and also to the preliminary calculation of the flight's parameters on the ground before take-off using electronic computers.

Naturally, careful personnel training and the receipt and installation of new mechanization systems are required for the operation of this airplane. Our specialists and workers manufacture part of the equipment. Flight personnel, engineers, technicians, and ground services specialists have undergone theoretical training at the Ulyanovsk Civil Aviation Center and on-the-job training at other enterprises where the Yak-42 airplane is already being operated.

The right to retraining is first offered to the best specialists and first-rate production workers.

The radio-electronic equipment maintenance section is being considerably expanded. In summing up this question, I can say that the training has been conducted according to a plan that has been worked out in advance. The Ministry of Civil Aviation approved in 1985 the plan for carrying out the preparations to base these airplanes in our administration.

The operation of the airplane on regular air routes began on 20 October. The first trip with passengers on board was carried out on 9 October to Sheremetyevo. Since then, one-two trips to Moscow have been carried out almost daily. These flights have shown that the preparation of the services did not take place badly. Passengers like the airplane.

[Question] What does the concept "Short Route Aircraft" mean? Does it have any relationship to the level of maintenance?

[Answer] This means that the airplane is designed for flights on air routes that are up to 1,550 kilometers in length. Food is not served to passengers on these routes. This means that the preparation of food is not provided for on the airplane. Put simply, there is no kitchen.

[Question] Will there not be passenger complaints on this score? Doesn't the opinion exist that the cost of food is included in the cost of the airplane ticket?

[Answer] This opinion is erroneous. The cost of food is not included in the cost of the airplane ticket. Aeroflot assumes all of the expenditures for food on itself. We would ask, however, the Agroindustrial Association of the Lithuanian SSR and the Ministry of Trade of the Lithuanian SSR to examine the possibility of preparing special rations to issue to passengers during a flight.

[Question] Will the free baggage allowance for a passenger be changed?

[Answer] The Ministry of Civil Aviation has established the maximum free baggage allowance norm for air routes within the union at 20 kilograms per passenger. This is also being retained for Yak-42 aircraft passengers. There are, however, peculiarities in the transportation of baggage. In addition to what a passenger can take with him into the cabin (a hand bag), the container shipment of baggage is provided. During check-in, luggage is taken and packed into a special container which is then closed, sealed and loaded into the airplane after check-in is completed. In addition to the fact that opportunities are presented to mechanize the process of loading and unloading luggage, better opportunities are established for the safe-keeping of the luggage and there is less probability of its damage.

[Question] What determines the selection of air routes on which the Yak-42 airplane will fly?

[Answer] First of all, we proceed from passenger requirements. On such routes as Moscow, Sochi, Mineralnyye Vody, Yerevan and several others, demand is not being satisfied. I think that this problem will be solved with the introduction of the Yak-42. Yak-42 aircraft will begin to carry out regular trips on the Palanga-Moscow and Palanga-Leningrad routes on 1 April 1987.

[Question] Will problems arise during the servicing of passengers in connection with the use of an aircraft with a large seating capacity?

[Answer] Actually, several problems arose at Vilnius Airport in connection with the start of Yak-42 operations.

First of all, it was necessary to handle 1.5-fold more passengers during the time allotted for passenger check-in and turning-in of luggage. Whereas previously there was an opportunity to seat passengers immediately before take off, this opportunity is now extremely limited (the containers are packed). Thus, passengers must be more disciplined.

Second, the working area, which is allotted to servicing passengers, has been considerably reduced due to the reconstruction of the airport terminal that is being conducted. A greater number of passengers and those seeing them off gather in the check-in area. There is a request to the Lithuanian SSR Ministry of Construction to conduct the work without falling behind schedule and to hand over to us storage premises by 1 January 1987.

Third, it is necessary to improve transport services in connection with the expansion of the construction of different enterprises and institutions in the vicinity of Kirtimay.

At the present time, it is practically impossible for passengers to get to the airport by bus during morning hours. It is necessary to increase the movement frequency of buses and to allot additional taxis during nighttime as well as during the morning and evening hours.

[Question] What is being done to assure technical maintenance?

[Answer] I have already said that we have had to obtain and install a large amount of different technical systems for servicing Yak-42 airplanes, including monitoring and testing equipment. We have great hopes for when the construction of the Aviation Technical Base-3 building is completed.

There are difficulties, however, in completing work directly on the airplane.

The completion of capital repairs to a hangar shelter for two airplanes was provided for in 1984. The Lithuanian SSR Ministry of Construction had planned this work. However, it has still not been completed as yet.

In 1985, the forces of the SU-6 [Construction Administration-6] general contractor in the Vilnyusstroy [Vilnius Construction] Trust completed an insignificant amount of work totalling 5,000 rubles. The SMU-1 [Construction Assembly Administration-1] subcontractor in the Prommontazh [Industrial Assembly] Trust has not begun to carry out his work (replacing the roofing, protective designs, etc.) since 1985.

8802
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1985 USSR PASSENGER LOAD FIGURES FOR URBAN ELECTRIC TRANSPORT

Moscow VESTNIK STATISTIKI in Russian No 11, Nov 86 p 67

[Unsigned table entitled "Urban Electrically Powered Passenger Transport in 1985"]

[Text]

KEY

1. length of operational single-tracked routes (in kms.)
2. number of passenger cars (in units)
3. number of passengers carried (in millions)
4. length of operational single lines (in kms.)
5. number of passenger trolleybuses (in units)
6. number of passengers carried (in millions)
7. length of operational double-tracked routes (in kms.)
8. number of passenger cars (in units)
9. number of passengers carried (in millions)

(Figures given as of the end of 1985)

SEE TABLE ON NEXT PAGE

Urban Electrically Powered Passenger Transport in 1985

	Streetcars			Trolleybuses			Subways		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	1	2	3	4	5	6	7	8	9
Alma-Ata	90.0	172	44.2	223.2	328	72.0	—	—	—
Ashkhabad	—	—	—	95.9	73	22.9	—	—	—
Baku	70.5	102	37.1	285.5	330	61.3	25.0	167	145.8
Vilnius	—	—	—	119.1	297	183.7	—	—	—
Gorkiy	198.2	457	153.8	194.3	282	58.4	6.8	56	5.3
Dnepropetrovsk	155.1	455	115.9	182.6	303	101.9	—	—	—
Donetsk	131.2	241	106.8	147.3	325	121.6	—	—	—
Dushanbe	—	—	—	119.3	247	67.1	—	—	—
Yerevan	96.6	184	31.3	254.5	383	67.1	8.9	33	23.6
Kazan	140.3	432	175.9	126.5	270	92.5	—	—	—
Kiev	266.1	923	363.7	295.4	1 104	379.5	32.7	385	368.6
Kishinev	—	—	—	171.5	403	157.8	—	—	—
Kuybyshev	159.7	461	135.2	177.8	279	70.6	—	—	—
Leningrad	681.3	2 180	999.4	660.7	1 206	484.7	81.5	1 205	821.2
Minsk	66.2	215	96.3	358.8	929	342.8	7.8	60	79.2
Moscow	466.7	1 221	500.0	1189.9	1 989	864.2	208.0	3 229	2492.0
Novosibirsk	185.2	463	147.7	248.9	335	97.6	7.3	56	0.0
Odessa	214.2	489	199.4	136.8	300	116.1	—	—	—
Omsk	111.2	189	70.9	124.3	201	56.8	—	—	—
Perm	122.6	271	132.0	69.3	100	71.2	—	—	—
Riga	122.0	332	176.0	215.9	430	207.8	—	—	—
Sverdlovsk	170.8	451	232.8	114.1	257	109.6	—	—	—
Tallinn	37.0	128	99.6	66.0	194	84.8	—	—	—
Tashkent	250.5	467	144.7	241.5	385	107.5	20.2	137	119.0
Tbilisi	100.1	111	47.3	96.0	223	62.6	22.9	161	144.8
Ufa	156.4	381	110.4	125.1	191	78.7	—	—	—
Frunze	—	—	—	166.7	220	70.8	—	—	—
Kharkov	263.4	795	247.0	249.3	610	222.2	24.0	211	234.1
Chelyabinsk	154.0	364	188.9	160.4	382	149.9	—	—	—

CSO: 1829/76

RAILROAD CHIEF URGES INCREASED USE OF RIVER TRANSPORT

Moscow EKONOMICHESKAYA GAZETA in Russian No 37, Sep 86 p 9

[Article by F. Kotlyarenko, chief of the North Caucasus Railroad: "On a Parallel Course: Why Are Factory Wharves Empty and Freight Awaiting Cars?"]

[Text] There was a time when industrial enterprises in the southern part of the country, as was the case, by the way, in other regions, were set up primarilly in the vicinity of major water ways, the Volga and Don, as well as on the Azov, Black and Caspian Seas. On the shores, the enterprises even built their own moorings and wharves.

Now it is as though they have forgotten about them, and, what's worse, in Rostov Oblast and Krasnodarskiy Kray alone, they have already eliminated more than 30 factory moorings and wharves. Apparently for uselessness: the plants have stopped using water routes for all practical purposes, perfering the railroad.

Thus, the "Krasnyy Aksay," a large agricultural machine building plant located right on the banks of the Don River, ships all of its output only by rail. As yet, not a single grain harvesting combine from "Rostselmash" has been shipped by water even thouth the association itself is located near a river port.

Agricultural machinery could be delivered to the Volga region, the center and northwestern parts of the country and to the southern Urals either by direct water traffic or with a single transfer to rail. Using "river-sea" vessels, one could go through the seaports of the Black, Azov and Caspian Seas and the river ports on the Dnepr to ship freight to the Ukraine, Moldavia, the republics of Central Asia and the southern regions of Kazakhstan. Transfering just this output to river workers during the navigation period would lighten the load on the extremely overburdened North Caucasus Railroad and would free up as many as 5,000 flatcars.

In Rostov there are other enterprises situated on the banks of the river: the oil and fat combine "Rabochiy," a chalk plant and plant for making asbestos cement items. Several of them had their own wharves at one time, of which nothing now remains.

The mooring at Taganrog Metallurgical Plant on the Sea of Azov has fallen into disuse, and more than 250,000 tons of pipe are shipped by rail to the country's

central regions, to the northwest, to the Urals and to the Ukraine, Moldavia and the Transcaucasus.

Restoration of just this moorage, and its joint operation together with the city's other enterprises ("The Red Boiler Maker," Taganrog Combine Plant and others)would permit us not only to reduce the load on the railroad, but to save significant money.

Estimates confirm that river transport saves 58 kopecks per ton over rail transport, and up to 70 kopecks per ton is saved when shipping on ocean vessles. By the way, estimates are not needed here: from his days on the school bench, everyone knows that transportation by water is most economical. But somehow, they have stopped considering this fact.

Up to 500,000 tons of Portland cement is shipped each year from Novorossiysk to Rostov, Azov, Taganrog and Volgodonsk by rail, parallel to the water routes. Delivering it on "river-ocean" vessels could reduce shipment volume by up to 300 million ton-kilometers and reduce transportation expenses significantly.

During the first year of the 12th Five-Year Plan, the plan for transfering lumber products to railroads in the ports of the Volgo-Donetsk River Steamship Company is 770,000 tons. Then this timber moves along by rail to the regions of the northern Caucasus and the Transcaucasus. A significant portion of it is sent to Moldavia and to the Ukraine, to regions served by the Donetsk, Dnepr [Pridneprovsk] and Moldavian Railroads, with the average distance from the ports of Rostov and Ust-Donetsk to the points of consumption being 1,120 kilometers.

If one were to convey this freight coming into ports on the Don further by ship to ports on the Azov and Black Seas, and on the Dnepr and Dnestr Rivers, the average distance shipped by rail would decrease to 350 kilometers.

The situation is analogeous with coal. In Perm, Syzran and Kuybyshev, it is reloaded from rail cars onto ships. And in Volgodonsk and Ust-Donetsk it is again loaded onto rail cars. Then it travels 500-600 kilometers to the Ukraine's thermal electric powerstations. And it would be possible to move the transshipment points to within 50-100 kilometers of the points of consumption by utilizing the ports of the Azov and Black Seas and the Dnepr.

The administration of the North Caucasus Railroad has repeatedly asked this of Minrechflot [Ministry of the River Fleet] RSFSR and Gosplan USSR. Several years in a row, we came in with proposals to make shipments more efficient even before annual plans were worked out. However, they have not been positively resolved. Why? Why over the course of many years has a problem so important to the government and so obvious and so understandable to even the least literate transport worker not yet been solved?

/We think that the main obstacle is departmental separateness. It is strange, but a fact/ (we have assured ourselves of this from our own bitter experience), that the RSFSR Ministry of the River Fleet and river workers from the Ukraine and sailors from the Black Sea and Azov basins do not speak the same language./ [Passages enclosed in slant lines printed in boldface type.] It is amazing,

but it happens that vessles of the Volga-Don Steamship company, and other companies of Minrechflot, do not find berths along the mooring walls in the ports of these basins. They are compelled to interrupt their water route in Ust-Donetsk, Rostov of Azov, load their cargos onto the railroad and move it farther along parallel to the same water route. Is this economical?

Commentary of EKONOMICHESKAYA GAZETA correspondent

[Commentary by M. Ovdiyenko, correspondent for EKONOMICHESKAYA GAZETA, Rostov-on-Don]

[Text] Frankly speaking, I at first got the impression that the author of the article, in criticizing the jurisdiction which is eating away the water transport workers, is himself to a certain extent expressing and defending his own departmental interests. Let us say, we give more freight over to the river workers and thereby make the life of the railroaders easier. But, no matter how you judge there is mismanagement present.

I decided to show the hand-written copy to the chief of the Volga-Don River Steamship Company, I. Mostovoy. It was interesting to learn what the river workers think about this matter.

Ivan Fedoseyevich, having finished reading, said with his inherent directness and decisiveness, "I am prepared to sign my name under every line of the article. The problem has not simply ripened, but has become a chronic disease. During the course of many years, we have had many "consultations," adopted many decrees and criticized the departments, but, as they say, things have not budged. It was already clear to everyone, and time to move the resolution of the problem onto a practical plane. And the sooner this would be done, the better it would be, not only for the region's economy, but for that of the country.

In Kotlyarenko's article, only a few of the railroaders' routes which run parallel to water routes were mentioned. The steamship company chief augmented them substantially. It turns out that during the navigation period it is possible to free the railroads from having to ship an additional 1 million tons and more of freight of various kinds. These include anthracite coal, fluxing agents, gravel, motor vehicles from KamAZ [Kama Motor Vehicle Plant] and GAZ [Gorkiy Motor vehicle Plant], pyrite cinders [peritnye ogarki], scrap metal and grain, one can't enumerate it all! Most of the cargos listed can be shipped by water on a direct link, using rail transport only over negligible distances. Moreover, it must be considered that the navigation period in the southern part of the country lasts 9-10 months each year.

"What is the root of the trouble," I asked Ivan Fedoseyevich.

/"This root is correctly singled out in the article: departmental separateness,"/ [Passage enclosed in slantlines printed in boldface type.] he replied. "Ships of the maritime fleet are plowing the oceans of the world. Management has set up a common center, Minmorflot [Ministry of the Maritime Fleet]. But within the country rivers have for some reason been divided among departments.

One can see from what has been said what this has led to. What is to be done to make a radical, sudden departure? First of all, eliminate the departmental approach to freight shipping. Planning freight flow should be improved in conjunction with USSR Gosplan and USSR Gossnab. This is the only way the shipping mechanism can be made to operate smoothly, a precise interaction among railroad workers, water transport workers and truckers can be achieved and the operation of all transport can be increased.

9194
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GENERAL DIRECTOR ON KamAZ MODERNIZATION PROGRAM

Moscow PRAVDA in Russian 3 Sep 86 p 2

[Interview of Vasiliy Alekseyevich Faustov, general director of the "KamAZ" Production Association by PRAVDA correspondent V. Goncharov: "The Road for KamAZ: Machine Building is the Catalyst of Progress".]

[Text] Everyone knows that in rebuilding, the initiative of labor collectives and the independence of management in the selection of needed economic decisions are given the main roles. Under such conditions, special responsibility is placed on the managers of large enterprises, which determine the technical policies in whole industries to a large extent. More must be entrusted to them, they should more rapidly be liberated from unnecessary guardianship from above and bureaucratic obstacles should be removed from their path.

Much has been done in this direction, but by no means enough. PRAVDA correspondent V. Goncharov talks with V. Faustov, general director of the "KamAZ" Production Association about this matter.

[Question] Vasiliy Alekseyevich, how has expanding the rights of labor collectives and the management at enterprises and associations shown up on work and initiative? Does the ministry leave you some independence in solving all questions?

[Answer] Unfortunately, this is until now one of the most critical questions in the system of management.

It is true that a substantial part of the restrictions has already been removed. As an example, leaving great leeway in the area of wage payments up to the managers has done much. Now we can set raises of up to 50 percent of the job wage rates for highly qualified foremen, technologists and designers. And substantial bonuses to workers for combining professions or for expanding their service area is in our hands.

At the same time, there are still many problems which, due to inertia, they won't let us solve on site. It is offensive at times, you see clearly what has to be done to improve work efficiency, but you can't do it; you are entangled by the many regulations controlling your activities down to the finest detail. You still have to waste a great deal of time in coordination. And it is obligatory when you go to Moscow.

If one were to analyze the available work time for our management, it would turn out that the greatest part of it is spent on out-of-town assignments. In just 5 months of this year, our workers spent a total of 1,270 days in Moscow.

To be sure, much is being done more rapidly and better under the new management conditions to which we converted this year. Suppliers deliver less, and our plants have started working more smoothly.

There is also less trouble with the work force. The limit to the number of workers is not planned now, and this is correct. It is more apparent to us on the site who and how many should be hired. However, the standard for growth of the wage fund should be more well founded.

It is still necessary to improve planning. Formerly, as an example, the production plan was entered over several hundred lines. Now we "fuss over" plan and design indicators. And, as before, we send the accounts to the ministry in expanded form, spread out over all of the numerous lines on dozens of pages.

And today we do not have the right to touch the management structure. In order to create a necessary section or introduce positions which we don't have, it is "apply to the ministry." And how much nervious strain is it worth to tie the production plan to material and technical resources! There has not yet been a single year when resources were allocated in the necessary quantities before the period being planned. As a rule, the production plan is affirmed in December, then, during the course of the year, just try and settle on what will be needed and where to get it from. In the first quarter, funds are set at the level of the first quarter of the previous year in advance and then corrected. And so it goes quarter by quarter. This ruptures lengthy ties, results in changing suppliers and interruptions in deliveries. Here nothing has changed today.

Today for us the main thing is to fulfill all deliveries based on agreements and supply authorizations. To do this, one would like to establish lengthy, direct ties with suppliers.

[Question] Does it turn out that it is not easy to maneuver the automotive giant, especially today when it is necessary to rebuild quickly on an intensive course of development?

[Answer] I'll tell you straightforwardly, it is not easy. Construction and expansion of plants and the development of the designs for new vehicles are under way, and, at the same time, there is the matter of increasing KamAZ vehicle production. In addition, we have to worry about a whole city with its growth problems.

Earlier we used to think: Now, let's say, we get firmly on our feet and it will be easier. We're up. We are emerging on the project boundaries. In certain directions, the difficulties are not fewer; on the contrary, there are more. Many think that this is the natural order of things. Something like within the family; the children grow and the problems also grow and get more complicated. Here we have an enormous industrial organism which is getting to its feet....But I maintain a different point of view. Any clock will run well for a skilled craftsman. All you have to do is let him decide for himself where to tighten it up, where to fix it in time....

[Question] It was assumed that the "KamAZ" Association would not only renew and expand the domestic vehicle fleet and improve its structure, but would also become a bold forerunner [Rus. 'pervoprokhodets'] in the economy. However, initiative is being more and more left to VAZ [Volga Motor Vehicle Works]. How do you explain this?

[Answer] There can be only one explanation: we have to show more initiative, achieve better indicators in our work. At the same time, I will tell you that in 1984 KamAZ, along with VAZ, came forward with the new idea of converting to a new system of economic operation based on being self-supporting. However, they converted just the Volga works.

Again this year we have put forward the idea of converting the KamAZ to being self-supporting since we feel that this system is more progressive and will aid us in accelerating scientific and technical progress within the association and increase production efficiency. This question is being considered within the ministry and USSR Gosplan. We affirm that the KamAZ collective is ready to convert to the new management track.

There is yet another reason we lag behind VAZ in the level of initiative. In our association, the development of the experimental base, without which rebuilding while on the move is impossible, has been slowed down. Today these problems are being solved more rapidly. Appropriate capital investments have been increased. And by the end of the five-year plan, we will significantly strengthen the facilities of the services engaged in preparing for production; we will bring them up to 7 percent of the rated capacity of KamAZ.

[Question] In addition, an automotive giant requires appropriate scientific support as well. Could it be that KamAZ should become a scientific and production association?

[Answer] This is also a critical question for us. During the 12th Five-Year Plan we must place 15 new vehicle models into production, including the compact "Oka", and remove 8 obsolete models from the conveyors, after having replaced them with modernized ones, while increasing the vehicle service life by 10-12 percent, reducing fuel consumption and improving other indicators.

It is just to this end that we are creating at the association the scientific and technical center for development of new vehicles which meet the world levels for automaking and even exceed them. It will be a developed engineering service, a large experimental base, even a factory where, by applying a flexible technology, we will begin small series of new vehicles. We will staff

the center with young engineers with initiative. Let them discover their own capabilities, their talents. The deputy general director will head the center. The head designer for series production will be engaged with on-going problems of the operating conveyors in earnest, primarily with production quality.

The experimental and research bases of the chief technologist, the chief metallurgist and other subdivisions will get further development. At the same time, we are counting on the more efficient utilization of the achievements of domestic science. As an example, we place considerable hope on our collaboration with the Ukrainian Academy of Sciences. Together with the Ukrainian scientists, we have worked out an entire program encompassing about 60 main topics concerning the basic trends in scientific and technical progress. The economic effect here will be calculated in tens of millions of rubles.

There is yet another dream. That is, following the example of "ZIL" [Moscow Motor Vehicle Works im. I. A. Likhachev], to set up our own plant VTUZ [technical higher education institution] with Kama Polytechnical Institute as the base. I think that everyone would win from this. We would be able to draw first-year students into solving problematic questions, and could take them on to work for us when they finish their studies.

The scientific and technical center, outfitted with modern research and test equipment and computer facilities, and the plant VTUZ could become a good base for converting KamAZ to a scientific and production association.

[Question] Vasiliy Alekseyevich, in a speech at Tolyatti, M. S. Gorbachev challenged autobuilders not to equal the best examples in the world, but to exceed them, to become the legislators of style on a worldwide scale. Is KamAZ ready for this?

[Answer] First, I would like to make one very important detail more precise. The KamAZ vehicle was designed with 3 axles for roads with low axle limits, up to 6 tons. Similar foreign models have 2 axles. In a word, one cannot compare the KamAZ's being produced with their 2-axle foreign-made fellow vehicles.

I will tell you frankly, people complain about the quality of KamAZ's, primarily their reliability and efficiency. Vehicle durability is still not high enough. And the fuel consumption is higher than for foreign vehicles from about the same class. But all of these 'diseases of growth' will be 'cured' during this five-year plan.

At the same time, our designers have also worked up 2-axle vehicles which, by the way, are in no way inferior to foreign models in their technical and economic indicators. I think that by the end of the 12th Five-Year Plan, they will surpass them in some parameters. We shall produce them at the scientific and technical center, in small series production.

I am sure of our collective: the Kama workers will not let us down. During this five-year plan, they will bring the Soviet brand truck to a worthy level. And we will move ahead noticeably within the economy. The entire increase in existing production volume, 40 percent, will come through growth of labor productivity.

9194
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MOTOR VEHICLES, HIGHWAYS

OFFICIAL OUTLINES NEW AvtoVAZ S&T CENTER FUNCTIONS

Moscow TRUD in Russian 6 Sep 86 p 1

[Article in the form of an interview with Vladimir Vasilyevich Kadannikov, first deputy general director of the "AvtoVAZ" Association and director of the Scientific and Technical Center, by V. Vostrukhin, TRUD special correspondent and Ya. Ali-Zade, TASS correspondent: "VAZ [Volga Motor Vehicle Works]: Road to the Future".]

[Text] The road to the future begins in the laboratories and workshops of the "AvtoVAZ" Association for many models of domestic small cars. Having come forward with an initiative for accelerating scientific and technical progress, the collective from the automotive giant obligated itself to renew and modernize all of the products it produces, and to reduce the lengths of time for readying for their production. However, a qualitatively new problem looms before the association, as it does before all of our domestic automotive construction industry: to become a dictator of style in the international automotive world.

At the regular meeting of the CPSU Central Committee Politburo, a number of major measures were examined which will provide for development of the "VAZ" autos during the current five-year plan with indicators which are in now way inferior to the best models in the world. To these ends, they are calling for the organization of a scientific and technical center with an experimental-industrial base, a center which is equipped with special equipment and instruments.

Vladimir Vasilyevich Kadannikov, first deputy general director of the "AvtoVAZ" Association and director of the Scientific and Technical Center, talks about the goals and problems of the new subdivision.

[Question] Vladimir Vasilyevich, what are the features of the Scientific and Technical Center?

[Answer] This is the first such organization in the country. It will include a research and design complex, a design center, an aerodynamic complex with climate-control chamber and will have an experimental production capacity of 3,000 vehicles and 10,000 engines per year. The period for producing a new model in the leading automobile-producing countries of the world is 4-5 years. This insures that their vehicles are highly competitive in the world market. The tasks of the "AvtoVAZ" Scientific and Technical Center include the development of a new model and two variants every year. The capacities which will be at its disposal permit it to do this.

[Question] But capacities are only half the matter. The most important thing is still the people. Who will be developing the new VAZ models? How will the creative search be stimulated?

[Answer] Part of the engineers, designers and other workers will transfer to the Scientific and Technical Center from other VAZ sections. We already have small groups of enthusiasts, seven to a group, who are literally obsessed by the ideas of the car of the future and are working very productively in this direction. We feel that many of the creative positions will be competitive. This will make it possible to select the best workers. If one were to speak of the material stimulus, we will take the creative contribution of each worker in the development of the vehicle into consideration. Moreover, it has been decided to give the name of the person who thinks it up and develops it to individual components or even a model, as it is being done, for example, in aircraft construction.

Finally, we are counting on the creative potential of amateur designers. Perhaps they do not know how to make an erudite drawing, but they can show how and what things should, in their opinion, be in a car. Part of the vehicles which the experimental production part of our center will manufacture will be sold to the people by "AvtoVAZ." Having organized a permanent link with the owners of these experimental cars, we will be able to consider the desires of our main appraisers, the auto lovers, better.

[Question] Will the new VAZ subdivision make it possible to consider the demand and the capabilities of various layers of the populace more flexibly? The ability of many foreign vehicles to compete is determined in many ways by the diversity of models of one and the same brand.

[Answer] We are incorporating in the VAZ auto, beginning with the eighth model, the possibilities for the most diverse variations. For each model we are specifying 3 variants: "norm," "standard" and "delux." Engine size will vary. This will permit us to improve the consumer qualities of our vehicles.

[Question] What will they be like, the VAZ autos of the year 1990, 2000? Will the "Zhiguli" class change?

[Answer] A program for automobile production until the year 2000 has been worked out. I cannot tell you in detail, for it is an industrial secret. But all "Zhigulis" will remain economy cars. They will be autos of greater safety, with reduced fuel consumption, ecologically cleaner and of a more contemporary design.

[Question] How do things stand with front-wheel drive? Many foreign companies have already returned to the usual, rear-wheel drive.

[Answer] For economy cars, front-wheel drive is the proper direction. According to our predictions, autos of the same class as "Zhiguli" will be front-wheel drive by the year 2000.

[Question] Vladimir Vasilyevich, what kind of deadlines are there for construction and start-up of the Scientific and Technical Center?

[Answer] You can see the buildings for the new "AvtoVAZ" Center only in model form for now. They will be built next to the plant on a site containing several tens of thousands of square meters in area. The first unit should come operational during the current five-year plan. All of the conditions necessary for the Scientific and Technical Center to be built within the planned deadlines and operating successfully, fully meeting its goals, are met.

9194
CSO: 1829/3

DIESEL, LNG ENGINE FOR KamAZ VEHICLES

Moscow TRUD in Russian 31 Aug 86 p 1

[Article by M. Temchina: "Gas for KamAZ: A Report from the Leading Edge"]

[Text] At their meeting the CPSU Central Committee Politburo approved an experiment and proposals for the broad use of natural and liquified natural gas as a motor fuel. Realizing the planned measures will permit a significant reduction in gasoline and diesel fuel consumption. Today we will relate how the specialists at the Central Scientific Research Institute for Motor Vehicles and Vehicle Motors (NAMI) developed a gas-diesel vehicle based on the "KamAZ" [A vehicle produced by the Kama Motor Vehicle Works]. It operates either on natural gas or diesel fuel.

The heavy "KamAZ" spunkily took off, leaving behind only a light cloud of dust. No thick clouds of acrid smoke, none of the customary noise of a working motor. Under the truck's body I am able to notice some red tanks filled with compressed natural gas.

"But in our times you can't surprise anyone with a natural gas-powered vehicle," I say to T. Filiposyants, head of the Diesel Operating Processes Laboratory at NAMI.

"The difference in this vehicle is that it can operate both on natural gas and on diesel fuel," says Teodros Rafaelevich. "Moreover, the KamAZ's motor is still the basic one, and the technical and economic indicators have not fallen off."

"And what does conversion to gas-diesel fuel yield?"

"Such a vehicle has many advangages. A single gas-diesel truck will permit us to conserve 10-12 tons of liquid fuel per year. As you have already satisfied yourself, such a vehicle produces less noise, and the toxicity of its exhaust gases is less than those of a typical KamAZ by almost a factor of 3. And it can go much greater distances without refueling, because in addition to the ordinary diesel fuel, this vehicle also has compressed natural gas in reserve. For the driver to shift from one type of fuel to the other, all he has to do is turn a switch on the instrument panel."

It took the scientific production team at NAMI a year and a half in all to complete the whole cycle of operations from design to the prototype, from the test stand to the finishing work.

Many plants in the industry are participating in the development and further improvement of gas-diesel vehicles. Presently, "LiAZ" [Likino Bus Works] and "LAZ" [Lvov Bus Works] buses, part of which will soon be converted to run on natural gas and diesel fuel, are being tested.

9194
CSO: 1829/3

FEATURES OF NEW KAZ-608V2-9368 TRUCK TRAIN

Moscow AVTOMOBILNAYA PROMYSHLENNOST in Russian No 9, Sep 86 p 27

[Article by A. Ye. Chelidze, Kutaisi Motor Vehicle Works imeni G. K. Ordzhonikidze: "The Modernized KAZ Truck Train"]

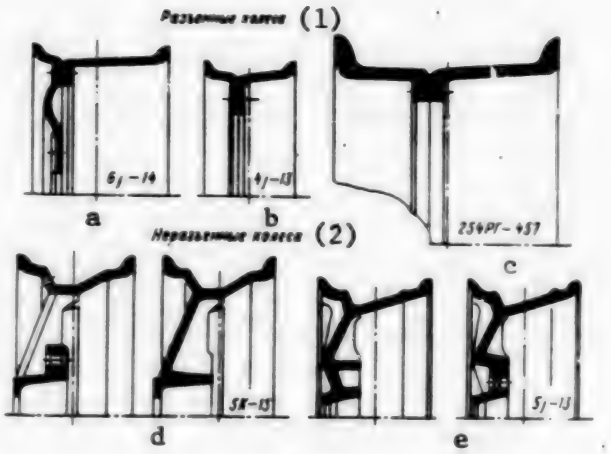
[Text] Along with mastering the new KAZ-4540+GKB-8535 truck train, which is intended for agriculture, the collective of specialists in the Kutaisi Motor Vehicle Works imeni G. K. Ordzhonikidze have completed the modernization of the serially produced KAZ-608V1-717 truck train. As a result, the technical characteristics of the truck train have noticeably increased and the material-intensiveness decreased.

The modernized truck train consists of a KAZ-608V2 prime mover with an increased carrying capacity and a KAZ-9368 single-axle semi-trailer. Because of the redistribution of the load between the bogie of the latter and the fifth-wheel coupling assembly, the carrying capacity of the prime mover has grown from 4.5 to 6.4 tons. The cross-country capability of the truck train has also been improved (thanks to increasing its coupling weight from 30.4 percent to 42.98 percent).

The following changes were made in the design of the prime mover: the girder frames have been strengthened. Their cross-section in the rear part has been increased from 140 to 180 millimeters); the attachment of the forward support of the rear spring to the frame has been improved. The supports are fastened using eight rivets instead of the previous six); and the sole plate and attachment of the fifth-wheel coupling assembly to the girder frames have been strengthened. Later on, it is planned to improve the material of the axle shaft of the rear axle with the help of high frequency current thermal treatment and several other measures. It is also planned to incorporate wedge-type locking and changeable balance shaft sleeves.

In the design of the KAZ-717 dual-axle semi-trailer, the base has increased from 4,650 millimeters to 6,000 millimeters; the dual-axle bogie has been replaced by a single-axle one; the members of the platform base are made of No 30 channels; and the sides, each of which consisted of three elements, are now made as two-element ones.

There are also reports about foreign firms using plastic to manufacture wheels for other transport systems, for example, bicycles, motorcycles, helicopters, airplanes, and rollers for tracked vehicles. Work is continuing in the CEMA member countries. Diagrams of several plastic wheels of different design execution and purpose, which have been developed in the Moscow Higher Technical Institute and the Central Scientific Research Motor Vehicle and Automotive Engine Institute, are provided in Figures 2a, b, c, and d; and in the Steks Scientific Production Association (Bulgaria)-- in Figure 2e.



Key:
1. Split wheel
2. Non-split wheel

Figure 2

The 6j-14 wheel (Fig 2a) for cars is designed for a radial load of 4.2kN and consists of two main elements with a joint in the plane perpendicular to the axis of rotation. Its outer element is made in the shape of a disk with a side rim, and the inner one forms the rim part and a second side rim. Both elements are connected to each other with bolts. Steel plates, which prevent the destruction of the material under the bolt head and nuts, are provided in the places where the latter are mounted and in the area of the openings for fastening the wheels to the hub.

The 4j-13 wheel (Fig 2b) for cars is designed for a radial load of 3.5kN and the 254 RG-457 wheel (Fig 2c) is designed for automobiles with high cross-country capabilities (a radial load of 23 kN). Both of them, just as the previous ones, consist of two elements, but they do not have a disk part. The openings for the bolts that connect the elements and for the bolt studs used to fasten the wheels to the hub are located on one diameter line. Steel ring plates are also provided at the places where the connecting bolts and fastening stud bolts are mounted.

The 5k-15 and 5j-13 (Fig 2d and Fig 2e) have also been designed for cars. Their radial load is equal to 4.7 and 3.7 kN, respectively. Both of them have a non-split design and more complicated configuration than those examined above. Assembly grooves are provided in their rim portion, and a rib with a complicated shape and openings for increasing rigidity, improving

the forced air cooling of the wheel brake and satisfying aesthetic requirements -- in the disk portion. The thickness has been considerably increased in the area of the openings for attaching the wheels to the hub and steel attachment bushings have been mounted. The 5k-15 wheel has been designed with a consideration for making it using the moulding method, and the 5j-13 wheel -- the injection moulding method.

Wheels of a split design can be made with the help of simpler equipment. In this regard, the mounting of the tires is simplified and safety in the event of a sharp fall in tire air pressure is increased. (There is no mounting groove). The advantages of a non-split design include higher accuracy in manufacturing, the absence of assembly operations, the opportunity to receive items after one operation, and the mounting of a tubless tire on the wheel without additional steps. In order to obtain such a design, however, more complicated equipment with joints in two-three planes and more powerful equipment are required.

The carrying capacity of a plastic wheel can be increased, as research has shown, by introducing a steel three-dimensional reinforcement into its rim and disk portions. (For example, one of the variants of a wheel,(254 RG-457) with such a reinforcement has withstood 1.5-2-fold more radial strain than without it). The use of the reinforcement, however, leads to a considerable complicating of the technology for manufacturing the wheels.

Different polymer materials from the reinforced plastic group can be used in motor vehicle wheels. These consist of thermo s etting plastic and thermo-softening plastic, which contain fiber reinforcement (mainly, glass and carbon fibers). Polyester, phenol and epoxy resins, polycarbons and nylon are the most suitable of the polymers.

Materials based on carbon fibers and epoxy resins possess high mechanical properties, but they are still expensive and that is why they are being used to obtain very critical objects that are under heavy strain. Glass-filled thermosoftening plastic is processed into items using a highly efficient method -- injection moulding, and that is why it is being used for large production volumes. Glass-reinforced plastic based on polyester and phenolic resins are the cheapest materials of those examined above. They are processed into itemsusing the moulding method, and when using polyster cold-hardened resins and fabric reinforcing materials -- the contact shaping method. (Table 1 provides several physical and mechanical properties of these materials.)

Plastic wheels can be manufactured using different methods: contact shaping, moulding, injection moulding, plastic deformation in a hard state (die-stamping), and winding. (the last method is still not being used because complicated special equipment, whose productivity is comparatively small, is needed to implement it.) The selection of the method depends (Table 2) on the type of material being used, the production volume and the design of the item.

Table 1

Material	Density kg/m^3	Strength Under Tension, MPa	Modulus of Elasticity Under Tension, MPa	Range of Operations Temperatures, C
Polyster, glass reinforced, cold-hardened plastic based on fabric	1600	230	12500	213-353
Polyester,glass-reinforced plastic semi- finished items (type AP-70-51)	1750	96	12000	213-373
Fiberglass moulding material (type DSV)	1800	80	20200	473
Carbon plastic based on an epoxy binder	1550	585	45000	213-373
Glass-filled poly-carbon	1520	120	10000	183-408

Table 2

Manufacturing Method	Material	Production Volume	Distinctive Features of the Item's design
Contact shaping	Laminated glass-reinforced plastic based on a poly-ester cold-hardened binder	Experimental, single	Not restricted
Moulding	Laminated glass-reinforced plastic based on a poly-ester hot-hardened binder	Small series	Split wheel with constant or variable section elements suitable for direct moulding
Shaping in a hard state (die-casting)	Glass-filled thermo-softening plastic	Large series	Non-split wheel with a simple design and small size
Injection moulding	Glass-filled thermo-softening plastic	Large series	Non-split wheel of complicated design

Accumulated experience, an analysis of foreign design and an evaluation of possible ways to develop them have permitted a classification for wheels to be developed in which composition polymer materials can be used. This classification is systematically reflected in Figure 3 where: 1-- a wheel; 2-- without a disk portion; 3-- with a disk portion; 4-- all plastic; 5-- plastic with metal elements (for example, the disk); 6-- compound; 7-- complete (non-split); 8-- with a three-dimensional reinforcement; 9-- without a reinforcement; 10-- with a longitudional plane joint; 11--with a cross plane joint; 12 -- with wheel disassembly during tire mounting; 13--with a central mounting groove; and 14-- with a displaced mounting groove.

The following versions of a design execution for wheels are possible.(there are 20 of them all told):

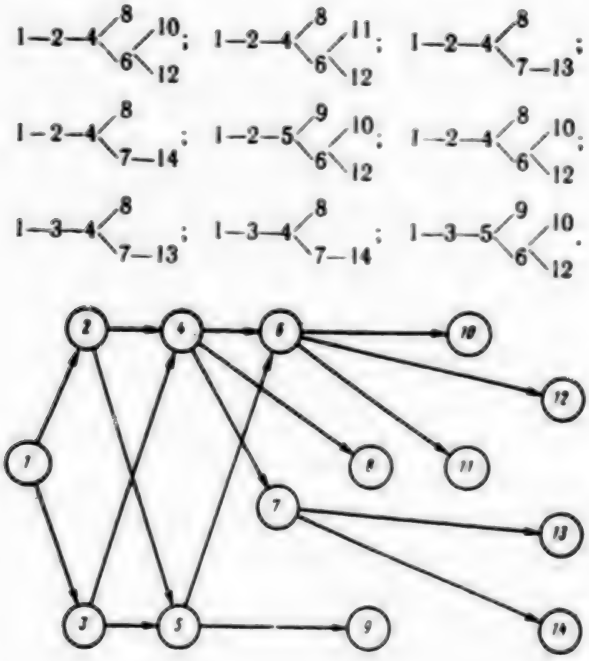


Figure 3

The orientation network (classification), which is shown in Figure 3, can be seen as a contiguity matrix. The design itself of the item, however, is a component part of a system with three interconnected elements ("design, material, technology"). Moreover, each of its parameters depends on the production run (an external determining factor).

The task, however, is being solved. To do this, the links between the system's elements (design, material and technology) are being regarded as non-orienting ones and are being put down in the form of three correspondence matrices ("material-design", "technology design" and "material-technology"). The new system is becoming the definitive one for the connections between the elements. Furthermore, additional linkage matrices: "series run-design",

"series run-material" and "series run-technology", are being introduced. Since all of the interconnections and descriptionsare now being presented in a matrix form, the search for a solution (the determination of the type of design) can be conducted using electronic computers with a special program.

Thus, the availability of composite polymer materials of different types and of ways to process them into items, the experience accumulated in building plastic wheels and the recommendations examined above for selecting their design permit the work of investigating opportunities to incorporate plastic into the undercarriage elements of our native motor vehicles to be expanded and extended.

8802
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 UDC 629.113.012.3-036.5

USE OF PLASTIC WHEELS EXPLORED

Moscow AVTOMOBILNAYA PROMYSHLENNOST in Russian No 9, Sep 86 pp 23-24

[Article by Candidates of Technical Science V. S. Tsybin and L. L. Gusev, Moscow Higher Technical School imeni N. E. Bauman and Central Scientific Research Motor Vehicle and Automotive Engine Institute: "Plastic Motor Vehicle Wheels"]

[Text] The area for using plastic in motor vehicles expands with each year. One of the prospective avenues is the manufacturing of undercarriage elements from them, especially the wheels.

The first information about the building of motor vehicle tires from plastic dates back to the end of the fifties and the beginning of the sixties. For example, it was reported in 1960 that the Moscow Motor Vehicle Works imeni I.A. Likhachev and the Moscow Higher Technical School imeni N. E. Bauman had begun work on building plastic wheels for motor vehicles with high cross-country capabilities. Thus, the ZIL-E167 snow-going motor vehicle (Fig. 1) was equipped with wheels (type 15-28) made of polyester, glass-reinforced, cold-hardened plastic. Later, plastic wheels appeared in France, the FRG and other countries.

Figure 1

As a result of the changes that have been made, the weight of the new semi-trailer (KAZ-9368) has become one ton less without changing its carrying capacity, and the weight of the prime mover has only grown by 80 kilograms.

As tests have shown, the modernized KAZ-608V2-9368 truck train is more dynamic and economical than the one produced before. For example, the planned fuel expenditure has been reduced from 42 to 38.5 liters per 100 kilometers. The number of tires on the semi-trailer has decreased twofold, and the load on them is close to the maximum. In connection with this, the pressure in them has been increased from 0.45 to 0.65 MPa .

The additional unification of the main and supplementary springs and brackets for their suspension has been assured thanks to the use of identicallly loaded axles on the prime mover and semi-trailer.

Thus, the design of the semi-trailer has been simplified and the time for its technical maintenance and repairs has been reduced as a result of the modernization. The frame, balance shaft, complicated cast brackets, axle suspensions, torque rods, and other items, which the dual-axle bogie included, have been removed from the design of the semi-trailer. The number of spare parts, applicable to the semi-trailer, has also been reduced.

The new truck train is more economical not only to produce but also to operate. Based on estimates, which have been coordinated with the RSFSR Ministry of Motor Transport, one truck train will save the national economy 3,000 rubles a year.

8802
CSO: 1829/24

PLANS FOR EXTENSION OF SECOND TASHKENT METRO LINE

Moscow TRANSPORTNOYE STROITELSTVO in Russian No 10, Oct 86 p 63

[Unsigned announcement in the "Chronicle" column: "In the Scientific and Technical Council of the USSR Ministry of Transport Construction"]

[Text] The Tunnel and Metro Construction Section has discussed a plan to build an extension of the second metro line for the city of Tashkent from the Pakhtakor Station to the Beruni Station.

Four stations are scheduled to be built along this segment: Gafura Gulyama, Chorsu, Tinchlik and Beruni. The operational length of the segment will be 6.04 km, and the actual construction length will be 6.09 km.

In order to accomodate rolling stock for the night and for servicing, there are plans to enlarge the second line's car yard to nine sidings.

The Gafura Gulyama Station will be columned, the Chorsu and Beruni Stations will by single-vaulted and made of prefabricated concrete components, and the Tinchlik Station will be made of consolidated reinforced concrete components. Construction of all stations is to be done using the cut-and-cover method in pile-supported trenches, while the Tinchlik and Beruni Stations will be done with anchor support (spiral steel anchors).

The connecting tunnels will be driven, in part with cast-iron lining, in part with prefabricated reinforced concrete lining. The tunnel and station facilities are to built with prefabricated and monolithic reinforced concrete.

The choice of construction techniques was influenced by urban development, engineering, geological and hydrogeological conditions, by foundation depth, and by the presence of pipelines and greenery.

Construction is scheduled to last 7 years and 3 months, including a 2-year preparatory period.

12912
CSO: 1829/25

EXPERIMENTAL SYSTEMS

PLANS FOR EXPERIMENTAL MAGLEV TRAIN

Project Outlined

Moscow IZVESTIYA in Russian 3 Sep 86 p 3

[Article by V. Khrustov, TASS correspondent for IZVESTIYA: "Flying on a Magnetic Wave: A Report from the Science Laboratory"]

[Text] The car rocked gently, and a powerful magnetic field lifted it off the ground. The Maglev train was ready to set off. In truth, it is just over the course at the VNIPIgidrotruboprovod
[All-Union Scientific Research and Design Institute for Hydraulic Piping (Systems)] Institute, where the "flying" 21st century express was developed.

"A high-speed, quiet, ecologically clean train on electromagnetic suspension can become mass-produced by the 21st century," says Yu. Sokolov, cand. of technical sciences. " But these advantages over traditional forms of transport, as strange as it sounds, have also become a serious hinderance to our work: none of the representatives of the country's transport departments wants to take the new express train under its sponsorship. Railroad people justly point out that it isn't a train, there are no wheels. Aviators are also perplexed by the nonconformity of our machine to standard lists, because the new express train can be called "flying" only figuratively, for it is firmly "tied down" to the ground. The product list produced by Minneftegazstroy [Ministry of Construction of Petroleum Industry Enterprises], to whom the institute is subordinate, is a long way from transport problems..."

By the way, interested persons were found, and construction of the "magnetic" line will begin in Armenia within a couple of months. The first sector, Yerevan - Abovyan, with a length of 3.2 kilometers, is experimental. The systems for the new railroad will be worked out there, and Maglev "pilot designs" will be studied. And within a few years, Yerevaners and guests to the Armenian capital will get a fast, comfortable link with the beautiful rest area on lake Sevan.

"This is the kind of express train which will serve this line," the specialists say as they point out the new kind of "bus." "Our new machine already knows how to do a lot. True, it still cannot fly, there is not enough electric power on the course for that, but it "hovers" with total ease at a given height.

By the way, we hope that by the end of the year our Maglev will fly: construction of a powerful substation is now being wound up. We are going to take all the sceptics for a ride on our 600-meter line."

Sokolov continues his story by saying that the cars on the Yerevan line will be more solid--19 meters in length instead of the present 12. The weight will increase correspondingly from 12 to 40 tons. It is designed for 65 passengers. The possibility of operating a hook-up of 2 cars is also being studied.

A car which could be used in metro tunnels is now being designed. Imagine: your plane lands at Vnukovo airport. You get into a "magnetic" train, it takes you toward the city, "dives" into a tunnel, and in 20 minutes, you are at the center of Moscow.

The high carrying capacity, speed, comfort and ecological cleanliness are undoubtable merits of the new form of transport. One must also keep in mind its relatively low cost: it is at least much cheaper than the metro system. This opens the broad possibilities of using it in cities with a population of 500,000-800,000, where the ordinary municipal transport system can no longer cope with the loads, but where a subway system is not profitable. Moreover, for a Maglev line elevated to a height of 10-15 meters, it is not necessary to look for space for it -- the supports can be set in a highway center strip.

I was not the only one that day to be interested in the institute's developments out on the course. The Maglev also drew the attention of my colleagues from Central Television. They are filming the feature film "Don't Joke with Robots [Rus.--"S robotami ne shutyat"]" here. Its action is set in the next century. Of course, they need appropriate settings. The Maglev turned out to be just what they needed.

Today the "flying train" is being filmed for movie. Tomorrow it will take its first passengers on board. And by the 21st century, the Maglev will probably become as common as the street car, electric train and metro are today.

Institute Deputy Director Comments

Moscow VODNYY TRANSPORT in Russian 7 Oct 86 p 4

[Article by I. Zagrebalov, Moscow: "The Maglev Flies over the Rails"]

[Text] The unusual shape of the train car I saw in the shed of VNIIPItransprogress's [possibly, All-Union Scientific Research and Design Institute for Transport Progress] test course in suburban Moscow assures us that the speeds for ground passenger transportation will increase significantly in the near future. This is a cigar-shaped vehicle with large windows on the sides and the roof which looks more like an aircraft without the customary wings and tail assembly than its "great grandfather," a subway car. Its designers call it a Maglev train. It moves on an electromagnetic suspension system, raising some 10 millimeters above the rails.

The experimental prototype of the Maglev can carry 20 passengers at a speed of 250 kilometers per hour. And the one for series production, which will be

used for regular service, will carry 60 passengers, with the electric power consumption per passenger being less than that of a subway train. The Maglev train will not contaminate the environment wither with harmful emissions or with noise.

A. Grigorov, deputy director of the institute, invites us to walk up the gangway, similar to that of an airplane, to board the Maglev. The spacious, comfortable passenger area has comfortable chairs; the pilot's cabin is in the interior. There are only some gages and tumbler switches on the instrument panel.

"Powerful electromagnets make the Maglev float above the rails," explains the scientist. The optimal lift height is maintained by the control system, which is assisted by an on-board computer. Horizontal movement of the car is also realized by means of an electromagnetic field. A linear, asynchronous electric motor is situated under the unit's floor. It is able to drive the 12-ton Maglev train to maximum speed in a matter of seconds.

On the course today they are completing the adjustment of the mechanical and electronics systems before the first runs. After finishing construction of a special run, it will have to begin taking passengers from the Armenian capital of Yerevan to the city of Abovyan.

Grigorov considers that the rapid and economical transport on electromagnetic suspension will bring about a true revolution in passenger transportation. It can be used both in town and for suburban traffic. Set out on an elevated course, it forms a second layer of passenger flow, and it will not interfere with normal transport.

Further Project Details

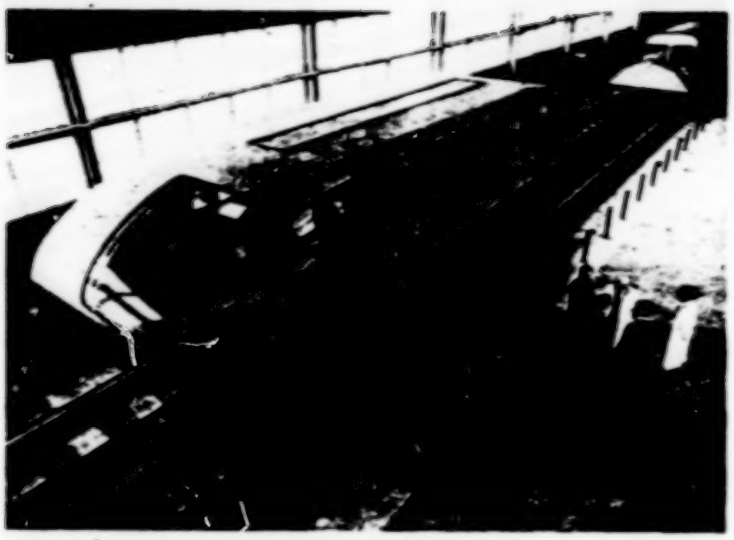
Yerevan KOMMUNIST in Russian 5 Oct 86 p 3

[Article by G. Manasaryan, chief of the Transport and Communications Division of Gosplan ArSSR: "The Maglev Train: Transportation for the 21st Century"]

[Text] Scientists and engineers the world over are looking for an alternative to the wheel, which has faithfully and truthfully served mankind for many centuries, but which is now a brake. Courageous, original projects are being developed. That which yesterday only stimulated fantasy is today, in part a common development of engineering. Such is the fate of the first domestic Maglev train, a means of transport which is new in principle.

One of the most promising trends in developing the new type of transport is the development of a transport system without mechanical contact between the rolling stock and the track bed. A magnetic gap performs the function of support.

The air gap is produced as a result of the repulsion of like poles of electromagnets afixed to the the track bed and the underside of the Maglev train. Due to the magnetic suspension, a 10 millimeter gap is created between the coach and the track bed.



An experimental car with
magnetic suspension (the Maglev train)

Work on a type of transport on a cushion of air began in the USSR and the developed capitalist countries in the 1960s, and has been particularly promoted of late.

A quiet linear electric motor is used, one in which there are no exhaust fumes to pollute the environment; it operates on an economical form of energy. As a roadbed, the linear beam of a reinforced concrete gantry raised from 1 to 15 meters above the ground is utilized.

Today the Maglev train can reach speeds up to 500-600 kilometers per hour. If one the advantages cited, the Maglev train can be considered a form of transport for the 21st century.

In recent years, research on magnetic suspension transportation has intensified significantly. Along with the FRG and Japan, which started this work in the late 1960s, Canada, England, France, the USA and Rumania have joined in the development of magnetic suspension transport. In recent years, work to develop systems for urban and commuter traffic is growing, in particular, to link cities with airports.

In the USSR work to develop the new type of transport is being conducted in accordance with a decree of GKNT [State Committee of the USSR Council of Ministers on Science and Technology] and a goal-oriented, comprehensive scientific and technical program. The head organization is VNIIPItransprogress of Minneftegazstroy USSR.

Back in 1980 the institute started compiling the technical and economic basis for construction of a suburban passenger transport system with rolling stock using magnetic suspension on the Yerevan-Abovyan sector, with subsequent extension of the system to Sevan.

The work was examined by Gosplan USSR's Gosekspertiza, approved and recommended for putting together the engineering project. Then the engineering project for the first line on the experimental operational

sector, 3.2 kilometers in length, was approved by the republic's Council of Ministers in 1986. The estimated cost of the first line in the system is 24 million rubles, including 14 million rubles for construction and installation work.

The operating principles of the totally new transport system will undergo tests on this section. The track will be extended forther, to connect Yerevan with Charentsavan, Razdan, the settlement of Tsakhkadzor and Sevan in the future. Within 15-20 minutes a passenger can get from the sultry city to the shores of Lake Sevan, and in 15 minutes, he can be at the ski base in Tsakhkadzor.

The basic technical decisions and parameters for the first line on the operational Yerevan - Abovyan sector are as follows: maximum rate of speed 180-200 kilometers per hour; projected passenger flow volume during peak hours on the Yerevan - Abovyan sector -- 5,000 passengers per hour, and on the Yerevan - Sevan line -- 17,000 passengers (per hour); gantry height -- from 1-15 meters. Both a suburban and an urban version of the vehicle will be worked out on the experimental sector.

Much preliminary work has preceeded all this. A special Gosplan USSR commission recommended developing the experimental sector in Armenia, taking into consideration the presence of a suitable industrial base in electrical engineering and electronics, qualified cadres and scientific and technical and design institutes.

The SKTBtransprogress [possibly, Special Design and Technological Office of Transport Progress], being the head institute for design, has as many as 40 co-executors, including within our republic the PO [Production Association] "Armelektromash", the SKTB [Special Design and Technological Office] for Semiconductor Technology, Yerevan Polytechnical Institute, VNIIKE [All-union Scientific Research Institute for Integrated Electrical Equipment] and the Yerevan branch of VNIISK [All-union Scientific Research Institute for Synthetic Rubber im. Acad. S. V. Lebedev].

A linear motors laboratory is organized in affiliation with Yerevan Polytechnical Institute, and has already been working in contace with the head institute for several years. In the city of Ramensk, on the test line, prototypes of future cars are being developed.

At the beginning of 1986, with the active participation of Yerevan Polytechnical Institute and other organizations, a 12-ton prototype car was created for the Yerevan - Abovyan sector, and its magnetic suspension was provided. Its testing while in motion will be started before the end of this year. Construction of a universal testing site for linear electromotor testing will be concluded. The collective at "Armgiprotrans" Institute is concluding development of the blueprints for the base, the depots, the gantrys and structures to implement the line.

The task of developing and incorporating into the national economy progressive types of machinery on the level of the world's best was posed for scientists, engineers and workers by a decree of the 27th Party Congress. Development of the Maglev train in Armenia can be considered such a piece of equipment.

An interdepartmental coordinating council on new types of transport has been organized in affiliation with Gosplan USSR and GKNT; the construction of the Yerevan - Abovyan sector is at the center of its attention. The client for the sector is the ArSSR Ministry of Motor Transport, and the general contractor is the "Armtransstroy" Trust of the USSR Ministry of Transport Construction. Erecting the gantries has been awarded to Roadway Team No. 117 of Mintransstroy [Ministry of Transport Construciton], and manufacture of the cars for the industrial prototype, to the USSR Ministry of Heavy Industry

The republic government is devoting great attention to the preliminary work. A comprehensive department of VNIIPItransprogress will be established in Yerevan to coordinate the work and developments on the individual questions.

The cited work embodies leading ideas which meet the requirements for acceleration of scientific and technical progress in developing ground passenger transport. And we can be proud that the new type of transport appeared in the country for the first time in our republic.

The republic's Gosplan has solved the question of including the first line of the experimental operational sector of the system between Yerevan and Abovyan in the plan for capital construction in the 12th five-year plan.

A total of 3.5 million rubles capital investment has been allocated for system start-up construction in accordance with the plan for 1987. Placing the first section into service is planned for 1991.

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